
Table 3-108. Timber Volumes sold on the Sumter NF from 1986 to 2001.

Year	Volume MMCF	Volume MMBF
1986	10.69	58.8
1987	11.36	62.5
1988	10.11	55.6
1989	9.88	54.4
1990	6.97	38.3
1991	8.18	45.0
1992	7.73	42.5
1993	8.10	44.6
1994	7.23	39.7
1995	6.41	35.3
1996	5.13	28.2
1997	5.44	29.9
1998	5.40	29.7
1999	4.34	23.9
2000	3.39	18.6
2001	2.81	15.5

The Forest Inventory and Analysis (FIA) section of the Southern Research Station remeasures permanent inventory plots across all ownerships in the southern states to provide large scale estimates of timber inventories and trends in the different states. There are approximately 94 FIA plots in the Sumter National Forest. Table 3-109 shows the estimated timber inventory, growth, and mortality from these plots:

Table 3-109. Timber inventory, growth and mortality for the Sumter National Forest, according to Forest Inventory and Analysis plots, South Carolina cycle 3 annual inventory, year 2000. All volumes are for trees ≥ 5.0 " diameter at a height of 4.5'.

National Forest Acres	344,838
Volume (MMCF)	711
Net Annual Growth (MMCF)	15
Average Annual Mortality (MMCF)	16

The above acreage is approximately 5% lower than the known acreage of the Sumter National Forest at roughly 362,850 acres. Accordingly, the volume estimates above should be adjusted upward by 5%.

Since 1985, prices for all wood products except pine pulpwood have increased substantially. Table 3-110 shows the change in stumpage prices.

*Table 3-110. Statewide average wood product prices for South Carolina, 1985 and 2002 (3rd quarter).
Prices from Timber Mart-South.*

	1985	2002, 3rd Quarter
Pine sawtimber, \$/MBF Scribner	149	297
Pine pulpwood, \$/cord	16.42	14.01
Hardwood sawtimber, \$/MBF Doyle	53	130
Hardwood pulpwood, \$/cord	3.00	15.83

Special forest products include various portions of commercial and non-commercial species of various plants, by-products of other forest operations, or are geological or mineral in nature. Since 1985, special forest products taken from the Sumter include: pine straw, cane poles, sawdust, soil, lighter wood, magnolia and dogwood limbs and leaves, cedar posts, Christmas trees, old barn lumber, pine bark, firewood, and boughs. Demand for these products is limited.

Direct and Indirect Effects

The timber resource is managed to provide a continuous flow of forest products and create a wide range of forest conditions, within the framework of sound silvicultural techniques. It is also one of the primary means of implementing many aspects of ecosystem management.

Designation of lands as suitable for timber production, and the allowable sale quantity (ASQ) that these lands can produce are selected to measure the effects of implementing the alternatives on the timber resource. ASQ describes the maximum volume of timber that may be harvested from lands suitable for timber production during a specified period, usually 10 years. This volume cannot be exceeded during a given decade, and it is not presented as a guaranteed harvest volume. The actual volume offered is the aggregate of individual project proposals, and is dependent on a number of factors including annual budgets and organizational capabilities.

ASQ and suitable acres respond to the various vegetation management strategies associated with achieving alternative goals, desired conditions, or objectives. The economic effects section of this document discusses the dollar returns of the harvest levels produced by the alternatives. Figure 3-11 shows the acres that each alternative designates as suitable for timber production.

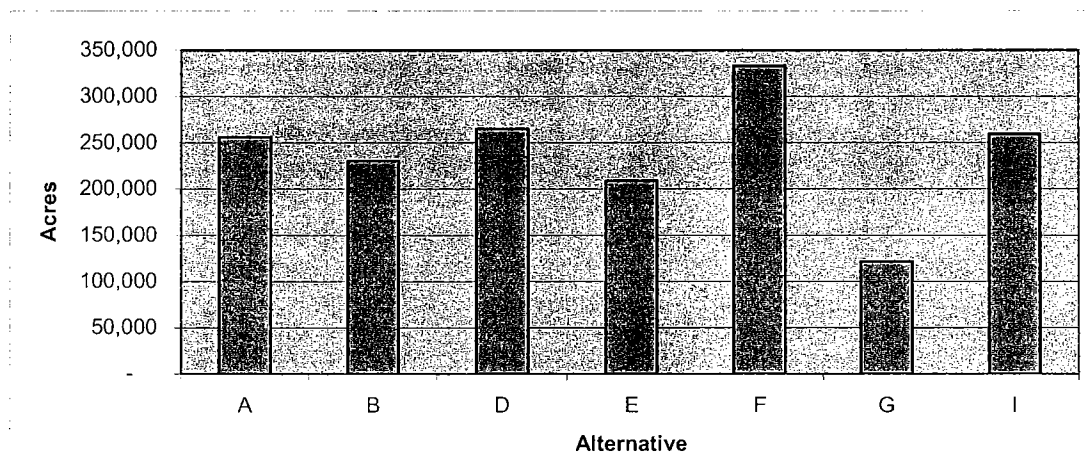


Figure 3-11. Acres Suitable for Timber Production by Alternative

Long-term sustained yield capacity (LTSYC) represents the highest yield of wood that may be sustained under a specified management emphasis. It also represents the volume of wood that may be managed while meeting all management requirements for protection of other resources. For each alternative, ASQ essentially equals the long-term sustained yield capacity (LTSYC) for the entire planning horizon, even the first decade.

This reflects the current condition of the forest, which gives numerous choices for harvest on suitable lands. Figure 3-12 displays LTSYC for each alternative. As one would expect, the levels of long-term sustained yield mirror the acreage that is suitable for timber production. The model used to estimate ASQ and LTSYC is not able to account for spatial relationships, such as adjacency. With an approximate 10-year order of entry, and the 5-year age after which regeneration harvest areas are no longer considered openings, adjacency should not present a problem. None of the alternatives would have the compartment level constraints that had limiting effects on implementation of the 1985 plan. Nor will the guidelines in the wildlife habitat management handbook be treated as standards as they were for the 1985 plan.

Figure 3-12. Long Term Sustained Yield Capacity by Alternative

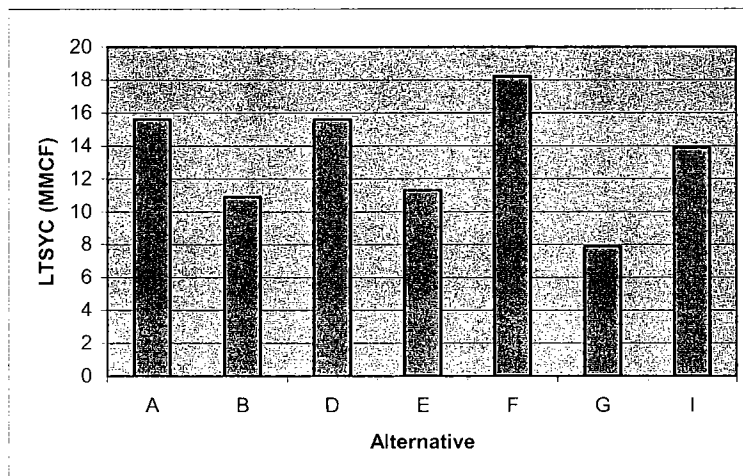


Table 3-111 displays the Allowable Sale Quantity by decade for each alternative.

Table 3-111. Allowable Sale Quantity in MMCF by Decade for Each Alternative.

Decade	Alternative						
	A	B	D	E	F	G	I
1	15.6	10.9	15.6	11.3	18.2	7.9	13.9
2	15.6	10.9	15.6	11.3	18.2	7.9	13.9
3	15.6	10.9	15.6	11.3	18.2	7.9	13.9
4	15.6	10.9	15.6	11.3	18.2	7.9	13.9
5	15.6	10.9	15.6	11.3	18.2	7.9	13.9
6	15.6	10.9	15.6	11.3	18.2	7.9	13.9
7	15.6	10.9	15.6	11.3	18.2	7.9	13.9
8	15.6	10.9	15.6	11.3	18.2	7.9	13.9
9	15.6	10.9	15.6	11.3	18.2	7.9	13.9
10	15.6	10.9	15.6	11.3	18.2	7.9	13.9

Table 3-112 displays the projected average annual net cash flow of the Sumter National Forest timber program.

Table 3-112. Projected Average Annual Net cash flow of Sumter NF Timber Program in Millions of Dollars by Alternative and Period, First 5 Decades, 1996 Dollars.

Alt	Measure	Annual Average Within Each Decade Period				
		Decade 1	Decade 2	Decade 3	Decade 4	Decade 5
A	Revenue	15.15	13.94	13.89	9.91	10.76
	Costs	2.46	3.52	3.30	3.01	2.80
	Net	12.69	10.42	10.59	6.90	7.96
B	Revenue	8.83	8.17	8.07	8.04	8.27
	Costs	1.06	1.64	1.66	1.46	1.58
	Net	7.77	6.53	6.41	6.58	6.69
D	Revenue	14.97	13.79	13.77	10.25	10.26
	Costs	2.27	3.61	3.33	3.17	2.81
	Net	12.70	10.18	10.44	7.08	7.45
E	Revenue	10.70	9.82	8.84	8.88	7.87
	Costs	1.52	2.12	1.97	1.65	1.89
	Net	9.18	7.70	6.87	7.23	5.98
F	Revenue	17.35	15.59	15.59	11.59	11.90
	Costs	2.95	3.83	3.96	3.62	3.22
	Net	14.40	11.76	11.63	7.97	8.68
G	Revenue	7.32	6.63	7.00	6.25	6.67
	Costs	1.06	1.34	1.40	1.31	1.41
	Net	6.26	5.29	5.60	4.94	5.26
I	Revenue	12.51	12.18	12.49	9.93	9.79
	Costs	1.80	2.77	2.90	2.62	2.51
	Net	10.71	9.41	9.59	7.31	7.28

Cumulative Effects

The Analysis of the Management Situation shows that the Sumter comprises about 3% of the timber supply and demand analysis area and 5% of the sawtimber inventory. Although the Sumter's role in the overall supply and demand picture is relatively small, it can be important to local loggers and mills. Soft prices for pulpwood may limit sales of small timber in some locations, but sawtimber prices are strong across the forest. The Sumter would be able to sell the quantities of sawtimber anticipated by any of the alternatives considered.

Lands and Special Uses

Affected Environment

The lands program includes:

- Acquiring, exchanging, and transferring forest land.
- Acquiring, granting and exchanging rights-of-way.
- Locating and maintaining property boundaries.
- Resolving land claims and trespasses.
- Processing and administering special use applications and authorizations.

The proclamation boundary of the Sumter National Forest encompasses 960,000 acres across 11 counties; however, only 364,000 of those acres are currently in national forest ownership. This equates to 38% of the land within the proclamation boundary is interspersed with privately-owned land. This intermingled ownership pattern causes some forest tracts to be inaccessible to the public and difficult to manage. Additional acres are needed to meet expected resource outputs (water, wildlife, threatened and endangered species, timber, recreation, wilderness and range). Between 1992 and 2002, approximately 7,521 acres have been added to the Sumter National Forest and 885 acres have been conveyed to private parties through purchases or land exchanges. Priority for acquisition or exchange is decided on a case-by-case basis in accordance with guidelines established in a Land Ownership Adjustment Strategy (LOAS). A LOAS will guide a planned, coordinated program for acquiring and adjusting necessary interests in land to optimize public benefits and administrative effectiveness of the forest, consistent with congressional direction and budget authorizations.

The national forest property boundaries total approximately 1,750 miles. Most of these boundaries have been located and marked, but maintenance of the lines remains a challenge. There are a number of title claims, encroachments, and trespasses.

The fragmented ownership pattern creates a need for legal access to isolated tracts of land. Rights-of-way acquisition is an ongoing part of the lands program, and is critical for management of the forest as well as to connect the public with National Forest System lands.

There are currently 231 special use authorizations covering 4,746 acres on the Sumter National Forest. Most authorizations are for road easements or permits. The Long Mountain Communications Site on the Andrew Pickens Ranger District is the only designated communications site on the forest. Guided raft trips on the Chattooga River are authorized under special use permits and represent a significant part of the outfitter/guide program. Other authorized uses include utilities, wells, cemeteries, communication uses, reservoirs, agriculture, churches, experimental or research areas, outfitters and guides, and oil and gas pipelines. About 20 new proposals for

authorizations exceeding one year are received annually for these types of uses. Numerous requests for authorizations less than one year are received every year.

Direct, Indirect and Cumulative Effects

The probable activities under all alternatives will have little to no effect on the current land adjustment program, since most of the activities occur under the current plan. The mixed ownership pattern will continue to provide opportunities for land adjustment through exchange, purchase, donation, and rights-of-way acquisition. In all alternatives the positive effects of an active land adjustment program could include protection of federally listed threatened and endangered species, congressionally designated areas, riparian ecosystems, environmentally sensitive areas, administrative sites, significant historical and cultural resources, and view-sheds for recreational pursuits. A potential negative effect of land acquisition is due to concerns from some individuals and government officials that acquisition of additional federal land will reduce the acres available for the property tax base and limit development potential for private enterprise.

Maintenance of property lines on a regular rotation will allow for effective land management, and a reduction of encroachments and title claims will be an added benefit.

Under all the alternatives, rights-of-way will continue to be acquired to secure legal access to allow for the use and enjoyment of the national forest by the public now and in the future.

Most special use authorizations are incompatible with wilderness and wilderness study areas and are eliminated by existing laws and regulations. The preferred alternative recommends the least number of acres for wilderness study, therefore would limit special use authorizations the least of all the alternatives. Special use proposals will continue to be processed and new and existing authorizations administered in accordance with Forest Service missions, policies, and regulations under all the alternatives. There will be minor differences between the various alternatives in the limitations and mitigation measures imposed on proposed special use authorizations in order to achieve the desired conditions described in the management prescriptions.

Prescribed and Wildland Fire

Affected Environment

Fire is a natural ecological process, but unlike the others (tornadoes, floods, hurricanes, etc.) humans have the capability to use fire as a tool and, as recent history has shown, to suppress the natural processes of fire. And by doing so, humans have most certainly changed the landscape and effects of fire once present. We must now consider the consequences of all our management decisions, and weigh suppression versus wildland fire use if we are to adequately manage the ecosystems entrusted to us.

Ecosystem sustainability has been defined as the capacity to maintain ecosystem health, productivity, diversity, and overall integrity, in the context of human activity and use. In the current Federal Wildland Fire Management Policy (2001), fire management and ecosystem sustainability is second only to firefighter and public safety. Fire management and ecosystem sustainability are described as “the full range of fire management activities being used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.”

“An important goal of ecosystem management is to retain structural and functional components across the landscape consistent with the capabilities of the ecosystem.” (Swanson et.al. 1973) The role fire plays is complicated because it influences and controls many ecosystem processes and characteristics. The many roles of fire include influences and alterations: plant species composition and community type, succession, scale of vegetation mosaic, fuel accumulations, dry matter and nutrient cycles and energy flows, wildlife habitat, interaction with insect and disease, ecosystem productivity, diversity, and stability. The concept of fire regimes can help us categorize the many-faceted role of fire. Knowledge of fire regimes is increasingly recognized as a critical basis for ecosystem management.

“Fire regime” refers to the nature of fire occurring over long periods and the prominent immediate effects of fire that generally characterize an ecosystem (Brown 2002). Classifications of fire regimes can be based on the characteristics of the fire (frequency, periodicity, intensity, size, pattern, etc.) or on the effects produced by the fire. Heinselman (1978) first introduced fire regimes based on a classification of fire intensity (crowning or surface fire), size of ecologically significant fires, and fire frequency or return interval. Kilgore (1981) modified Heinselman’s fire regimes by relating fire intensity to fire severity when referring to mortality of the primary tree cover as stand replacement. More recent fire regimes by Morgan and others (1998) used fire severity and fire frequency to establish four fire severity and five fire frequency classes.

The National Fire Plan, *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems A Cohesive Strategy* (2000), combines fire frequency, expressed as fire return interval, and fire severity established by Hardy and others (1998). The five historic natural fire regime groups are:

- Group 1 – (0 to 35 years) low severity.
- Group 2 – (0 to 35 years) stand replacement severity.
- Group 3 – (35 to 100+ years) mixed severity.
- Group 4 – (35 to 100+ years) stand replacement severity.
- Group 5 – (more than 200 years) stands replacement severity.

Using fire severity as a key component in describing fire regimes is appealing because it relates to direct or primary fire effects disturbance, which concerns ecosystem management. The classification of fire severity, and thus fire regimes, is based on the

effects from fire on the dominant vegetation. The following describes the fire regimes used in *Flora and Fuel Volume* (Brown 2000):

- Understory fire regime (applies to forests and woodlands): Fires are generally nonlethal to the dominant vegetation and do not substantially change the structure of the dominant vegetation. Approximately 80% or more of the above-ground vegetation survives fires.
- Stand-replacement fire regime (applies to forests, woodlands, shrublands, and grasslands): Fires kill above-ground parts of the dominant vegetation, changing the above-ground structure substantially. Approximately 80% or more of the dominant vegetation is either consumed or dies as a result of fires.
- Mixed severity fire regime (applies to forests and woodlands): Severity of fire either causes selective mortality in dominant vegetation, depending on different tree species' susceptibility to fire, or varies between understory and stand-replacement.
- Nonfire regimes: Little or no occurrence of natural fire.

Historical human intervention (suppression, timber harvesting, grazing, and other past management activities), natural disasters such as Hurricane Hugo, insect and disease, and the reduction of landscape burning have resulted in fire regimes that are far from "historical norms." The greatest effects of human intervention have been on short fire-interval ecosystems, where fires occur every 10 years or so. By contrast, longer fire-interval ecosystems, 100 years or more, are probably not as affected, and have less chance for unnatural fuel accumulations and changes in forest structure. In low intensity fire regimes, fire exclusion has allowed shifts in species composition, often from fire tolerant to intolerant species.

Departure from historical fire regimes to current conditions has been described as condition classes in the National Fire Plan, *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy* (2000). "Current condition is defined in terms of departure from the historic fire regimes, as determined by the number of missed fire return intervals – with respect to the historic fire return interval – and the current structure and composition of the system resulting from alterations to the disturbance regime." As condition class increases, so does the relative risk of fire-caused losses of key components defining the system. Key components include: species composition, structural stage, stand age, and canopy closure. The fire condition class as a measure of general wildland fire risk and ecosystem condition are defined as follows:

- **Condition Class 1:** For the most part, fire regimes in this fire condition class are within historical ranges. Vegetation composition and structure are intact. Fire dependent ecosystem components are maintained by desired fire regimes. Thus, the risk of losing key ecosystem components from the occurrence of wildland fire remains relatively low.
- **Condition Class 2:** Fire regimes on these lands have been moderately altered from their historical range. A moderate risk of losing key ecosystem components

has been identified on these lands. Fire frequencies have departed by one or more return intervals. Vegetation composition has been moderately altered.

- **Condition Class 3:** Fire regimes on these lands have been significantly altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure, and diversity have been significantly altered. Consequently, these lands verge on the greatest risk of ecological collapse.

The National Fire Plan, *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy*, and subsequently the *10-Year Comprehensive Strategy*, outline an approach to management of wildland fire, hazardous fuels, and fire dependent ecosystem restoration and maintenance. The focus on treating hazardous fuels is to reduce the risk of unplanned and unwanted fire to communities and the environment. Performance measures from the *10-Year Comprehensive Strategy* are focused on moving the number of acres in fire regimes 1, 2, or 3 to better (lower risk) condition classes, while treating in order of priority those acres in the wildland urban interface (WUI), then those areas in condition class 2 or 3 in fire regimes 1,2 ,or 3 outside the WUI.

With changes in forest structure and accumulating fuels comes the increased risk of catastrophic fire. Catastrophic fire can have devastating effects environmentally, socially, and economically. As more and more people build within or near these fuel build-ups, the risk of catastrophic loss from wildland fire becomes a matter of when rather than if.

According to the 2001 Federal Wildland Fire Management Policy, response to wildland fire is based on ecological, social, and legal consequences of the fire. Consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response. Often, the values to be protected include wildland urban interface (WUI). Wildland urban interface is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. This often drives suppression rather than fire use for ecosystem benefit.

Fire managers must continually consider:

- Ecosystems are always changing. Fire is a major agent of that change.
- Fire suppression has a place in fire management.
- Fire exclusion has environmental and economic consequences.
- Using prescribed fire to meet ecosystem objectives results in social tradeoffs.

Background

Fire behavior and its effects vary within the Sumter National Forest. The piedmont is characterized by gently rolling hills. Fires here, though sometimes numerous, are usually small. Steeper, longer slopes characterize the mountains, and affect fire behavior and fire size more dramatically than the topography found on the piedmont. Consequently, the mountains have the potential for larger fires.

The Sumter National Forest is dominated by fire-adapted and fire-dependent ecosystems. Most of the forest is characterized by short return interval (<35 years) understory fire regimes with low to moderate intensity ground fires that generally are non-lethal to the dominant trees. The piedmont and mountains consist of a combination of 0-10 and 0-35 years fire return interval communities. Stand replacement fires may occur within these regimes due to such things as topography, time of year, fuel conditions, weather conditions during a fire, or drought, etc.

The Sumter National Forest suppresses an average of 30 wildland fires annually, which burn approximately 200 acres of national forest land. Ninety percent of these fires are human caused, with most being caused by incendiary and escaped debris burning. Ten percent of the fires are caused by lightning. Eighty-six percent of the fires were 10 acres or less.

The forest may expect 40-50 days of high fire danger and one day of very high to extreme fire danger, annually. Most fires occur during the high fire danger periods with flame lengths of 3-5 feet. Severe and extreme droughts occur periodically, usually beginning in the spring and may continue through November. During these periods the Keetch-Byrum Drought Index may reach 700+. In the past 25 years, the Sumter has had 17 escape fires (over 100 acres), an annual escape fire frequency of 0.68 and an average of 234 acres burned per year.

The current fire management program has resulted in an average of nine fires per 100,000 acres protected with 0.05% of the forest burned annually.

Many factors influence the complexity of wildland fire management on the Sumter, particularly as it relates to ecosystem management. Two primary factors are forest fuels and wildland urban interface. Major factors affecting forest fuels are dominant vegetation type and age (overstory, midstory and ground cover) and presence of insect and disease. Clearcutting over the past 20 years has resulted in a mosaic of 0 to 20 year-old pine stands. Fires starting in reproduction are harder to suppress than open stands with light fuels, have a greater potential of increased mortality to adjacent overstory, and increase the potential for crownfire and stand replacing fires. A recent infestation of the Southern Pine Beetle has dramatically increased the amount of fuel present, both on the ground and standing. This in turn has increased the available fuel present, potentially increasing both fire behavior and effects. Currently 38% of the Sumter is being treated for the Southern Pine Beetle. Treatments include salvage sales in the piedmont and cut-

and-leave activities in the mountains and piedmont. Both types of treatment will increase hazardous fuels on the ground, and add complexity and hazard to suppression efforts and wildland fire use.

The dispersed ownership pattern of the forest positions wildlands and private structures in juxtaposition. Much of the forest can be classified as wildland urban interface. This wildland urban interface places the private structures at increased risk from wildland fires and vice versa. The hazardous fuels reduction program strives to reduce this risk.

The hazardous fuels reduction program focuses on treating the fuels hazard in condition classes 2 & 3 and bringing into condition class 1, with priority in the wildland urban interface. Fuels reduction is accomplished primarily using prescribed fire or mechanical methods, but other methods may be used, such as chemical or animal. The current prescribed burning program for hazardous fuel treatments and resource management treats about 20,000 acres annually. Approximately 18,000 acres of the average are burned for hazardous fuels reduction and 2,000 acres for other resources management.

The significance of the wildland urban interface increases as the populations in these areas increase – the upstate of South Carolina is a population growth area. People are attracted to living in the wildland setting for many different reasons. As human development and recreation use impinge upon these fire regimes, increased ignition risks and concern for protecting economic values will substantially affect fire management activities in these areas. If suppression continues, and fire is excluded from these areas, fuel loadings will increase, resulting in increasingly greater risk for larger and more intense fires. Ecosystem management and forest health concerns are expected to increase the role of management-ignited and wildland fire use in the future.

Fire dependent ecosystems on the Sumter National Forest fall into nine vegetation community types and only one fire regime. There are six primary, significant size, and three secondary, insignificant size, community types. However, three primary communities (shortleaf pine-oak, shortleaf/pitch pine, and shortleaf pine/loblolly pine) have been combined into the shortleaf pine/pitch pine/pine-oak for ease of analysis, since we are primarily concerned with fire effects and fire return interval. All three secondary community types will be omitted from this section analysis, because of their insignificant size and the overlap with another section. Table 3-113 displays current community types and corresponding fire return intervals on the Sumter, for forested lands only.

Table 3-113. Current community types and corresponding fire return intervals on the Sumter NF.

Community Type	Fire return interval (years)	Total Acres	Percent of Forest	Fire Regime
Dry-Mesic Oak	10-35	52251	14.80 %	Understory t To Mixed
Dry and Xeric Oak	3-10	12142	3.44 %	Understory
Shortleaf Pine/Pitch Pine/Pine-Oak (all mixed types)	2-10	29286	8.29 %	Understory
Loblolly Pine-Oak (Dry & Dry-Mesic Oak-Pine in part)	10-35	213707	60.52 %	Understory
Table Mountain Pine (Pine & Pine-Oak in Part)	10-35	33	0.01 %	Stand- replacement
Mountain Longleaf Pine (Pine & Pine-Oak in Part)	6-10	74	0.02 %	Understory
Grass Dominated communities	2-10	146	0.04 %	Stand- replacement
Not Fire Dependent	-----	45493	12.88 %	

Note: Some communities could have been broken down even further; however, since we are concerned with fire effects and fire return interval, they were combined for ease of analysis.

The shortest return interval of 2-10 years represents a total of 12% of the Sumter. The remaining fire dependent ecosystem has a return interval of 10-35 years and represents 75% of the Sumter.

The short fire return interval on the Sumter reflects an understory fire regime, or group 1 fire regime. This is a fire-maintained ecosystem in which light or low intensity fires reduce the occurrence of destructive wildland fire through thinning and pruning. Fires of low to moderate intensity also remove dead and downed surface fuels before they build up, reducing the risk of severe or high-intensity fire. Vegetation or plant communities within this fire regime demonstrate adaptations that maintain or preserve the individual species following repeated fire occurrence. As stands approach higher ends of the fire return interval, a more mixed result from fire can and would be expected. If fire is excluded, the health, composition, and diversity of the plant community can be quickly altered, and stand-replacement fire is expected. Fire dependent ecosystems with this short return fire interval, 10 years or so, change structure quickly in the absence of fire, becoming increasingly unstable. This fire regime represents 87% of the Sumter.

Table 3-114 displays the desired acreage in condition class 1 for fire-dependent communities.

Condition class is a measure of general wildland fire risk and ecosystem condition.

Table 3-114. Desired acreage in Condition Class 1 for fire-dependent communities on the Sumter National Forest 10 and 50 years following adoption of plan revision. (Based on Alternative I)

Community Type	10-year Condition Class 1 Objective	50-year Condition Class 1 Objective	Fire return interval (years)
Dry-Mesic Oak	33979	50592	10-35
Dry and Xeric Oak	9613	12120	3-10
Shortleaf Pine/Pitch Pine/ Pine-Oak (all mixed types)	23945	28877	2-10
Loblolly Pine-Oak (Dry & Dry-Mesic Oak-Pine in part)	181555	207852	10-35

These acreages represent first approximations of objectives related to acres of fire-dependent communities restored and maintained in condition class 1. These objectives are essential in managing our fire dependent ecosystems for ecosystem sustainability and protecting our communities from the threat of catastrophic wildland fire. Details on how these objectives would be achieved will be covered in forest-level fire management plans.

In order to obtain the above 10-year and 50-year condition class 1 objectives on the Sumter, the following annual acreage as shown in Table 3-115 would be necessary under Alternative I.

Table 3-115. Annual acreage by Condition Class 1

BURN PROGRAM	10-year Condition Class 1 Objective	50-year Condition Class 1 Objective
Low end	9514	11484
Mid point	23122	27903
High end	36730	44323

These acreages are unconstrained by budget, environmental, and agency restrictions, and only include prescribed fire acres related to fire dependant communities listed in Table 3-114 above, and condition class 1 objectives. As previously mentioned, grass dominated, mountain longleaf and Table Mountain pine acres were not included in this section, since they are in the Terrestrial Habitats section.

Direct and Indirect Effects

Management activities and natural processes affect fire and its environment, commonly known as the fire environment. In order for a fire to burn it needs three things: heat (ignition), fuel, and oxygen. Management activities affect all three of these components, while manipulation of forest vegetation and fuels has the greatest influence. It is

important to remember that activities in alternatives will differentially affect the fire environment; for example, reducing road density will decrease access and lower the risk of human-caused ignition, but will increase response time and effort allowing the fire to grow in size. Management activities affect the fire environment, influence the amount of wildland fire, and influence the need for or ability to use fire, either management ignited fire or wildland fire use.

Risk of Wildland Fire (Ignition Source)

The primary ignition source for fires on the Sumter is arson. As human activities increase, the potential for ignition increases as well. Access into and throughout the forest, whether motorized or not, will increase the risk of arson fire.

Alternative G will pose the least risk for arson fire to occur, while alternative A will create the greatest potential risk. Table 3-116 displays the miles of non-motorized and motorized access for a 10-year period.

Table 3-116. Motorized and Non-motorized Access, for 10 year period.

		ALT F (current)	ALT A	ALT B	ALT D	ALT E	ALT G	ALT I
Non-Motorized Trails	Miles	220	435	220	220	435	220	385
Motorized Trails	Miles	46	106	46	46	106	46	86
Road Construction / Reconstruction	Miles	368	315	224	284	255	172	298
TOTAL MOTORIZED ACCESS	Miles	414	421	270	330	361	218	384
TOTAL ACCESS	Miles	634	856	490	550	796	438	769

Motorized and non-motorized roads and trails increase human activity on the forest and result in an increased risk of wildland fires from arson. Motorized vehicles pose an additional risk of ignition from vehicles.

Decommissioning roads can reduce human access and the risk of human-ignition sources. The amount of road closures by alternative was consistent at 7 miles per year.

As recreation user density increases human activity on the forest, the risk of human-caused ignition increases. Campfires are a common source of wildland fires across the National Forest System. Dispersed sites pose a greater risk of escaped campfires than do developed recreation sites. Alternatives A and D are the only alternatives maintaining or constructing developed recreation sites.

Active timber harvest activities increase the risk of ignition from increased human activity and machinery. These effects were not considered significant since provisions within the contract mitigate them.

Fuels

Fire, like many processes, depends on certain conditions to exist. Whether or not a fire burns and how it behaves is dependant on fuels, weather, and topography. While we cannot readily change weather or topography, we have a tremendous impact on fuels. Management activities change fuel characteristics and influence fire behavior, affecting: horizontal and vertical arrangement (both live and dead fuels), loading, moisture, and temperature.

Although dispersed and developed recreation temporarily rearrange fuels which may burn during a fire, generally reducing risk of damaging fire to the site by decreasing fuel loads, they also increase ignition risk from humans. The overall result would be a negligible effect on fuels.

On the other hand, timber harvest activities affect fuel conditions more than any other management activity. Timber harvesting temporarily increases fuel loads from slash and activity fuels, depending on utilization of cut material. However, this temporary fuel increase and arrangement is mitigated in administration of the timber sale contract and provisions contained within. Contract provisions that require reduction or removal of slash mitigate activity fuels.

The general increase in fuel loads immediately following a timber harvest results in an increased risk of destructive wildland fire due to increasing fire intensity and rates or spread, making fires more difficult to control. These effects usually diminish within a few years as logging slash decays and deteriorates. Site preparation activities such as: handfelling, herbicides, and drum chopping will mitigate activity fuels from even-aged regeneration activities in all the alternatives. In general, the long-term benefits are reduced natural fuel loadings and a breakup in fuel continuity, resulting in decreased fire intensity, reduced risk of catastrophic fire, and fires that are easier to control. Harvest prescriptions which reduce canopy closure and stems per acre also reduce the potential for crown fires that are independent of surface fire. Table 3-117 displays the amount and type of harvest by alternative, for the 10-year period.

Table 3-117 displays the amount and type of harvest by alternative, for the 10 year period.

		ALT F (current)	ALT A	ALT B	ALT D	ALT E	ALT G	ALT I
Even-Aged Regeneration	Acres	45060	39050	16110	35110	23390	16140	31910
Thinning	Acres	30000	20000	50000	20620	26450	20000	22430
Stand Improvement	Acres	47590	32610	5310	35540	18580	10180	26850
TOTAL	Acres	122650	91660	71420	91270	68420	46320	81190
PERCENT Forest treated		43	32	24	32	24	16	28

Even-aged regeneration, thinning and stand improvement activities reduce ladder fuels, crown density, and over-all fuel loads, decreasing crown fire potential and mortality from fire. Alternative F treats the most forested acres with these harvest activities, followed closely by Alternatives A, D, I, B, and E respectively.

Even-aged regeneration, thinning and stand improvement activity acreages, are lowest in Alternative G. This alternative has the greatest potential for increasing fire intensity and tree mortality from stand replacement fire due to accumulating dead and ladder fuels. This in effect limits appropriate management response to suppression, greatly reducing the chance of using naturally ignited fire for resource benefit. Accumulating fuels and increased crownfire potential also result in conditions where firefighter safety is reduced without additional mitigation.

Suppression

The factors listed above influence fuels and thus fire behavior. Fire behavior (intensity, rate of spread, spotting and crowning, etc.) is a major concern to fire managers as it affects appropriate management response (suppression tactics versus wildland fire use), safety, fire size, and resource benefit or loss from fire. Restrictions on suppression tactics can decrease firefighter and public safety, and increase behavior and fire size. While it is important to allow natural processes to take place when and where appropriate, these restrictions need to be addressed.

The following table represents the number of acres in each suppression type by alternative (Table 3-118). Restricted suppression refers to management areas with limitations on suppression activities, which confines the scope of appropriate

management response by restricting the use of some suppression resources. Severely restricted suppression refers to those areas where limitations on suppression activities are most restricted, resulting in the most confined appropriate management response option and fewest suppression resource options. Unrestricted suppression refers to areas with no restrictions or limitations placed on suppression resources. Table 3-118 displays the suppression changes by alternative.

Table 3-118. Suppression changes by alternative:

Alternative	Suppression Unrestricted		Suppression Restricted		Severely Restricted	
	Acres	%	Acres	%	Acres	%
F (current)	357403	98.5	424	0.1	5133	1.4
a) A	289459	79.9	62126	17.2	10490	2.9
B	278374	80.4	57746	16.7	9920	2.9
D	294505	81.6	61578	17.1	4960	1.4
E	291804	80.8	61200	17.0	7938	2.2
G	289436	80.4	61340	17.0	9148	2.5
I	286708	80.7	64240	18.1	4236	1.2

Alternative F had the greatest unrestricted area, allowing the most productive suppression methods to exist in the greatest percent of the forest. Suppression resources are able to use the most efficient resources in more of the forest under Alternative F. This should keep unwanted fires in this alternative the smallest, thus resulting in the least risk to resources and public.

As was discussed previously, activities differentially affect the fire environment. Although Alternative A has the greatest potential for human caused ignition of wildland fires because it increases the total mileage of non-motorized and motorized trails and roads, it will also improve response times and effectiveness in suppression efforts, compared with the other alternatives. In addition, roads and trails also redistribute fuels, limiting the spread of wildland fire and act as fire barriers by serving as control lines for wildland fire control.

Risk to Wildland Urban Interface (RX Fire) or Risk to Resources Loss and WUI

Management ignited fire, or prescribed burning, is an important tool for mitigating negative impacts on fuels and ignition risk caused by management activities. Prescribed burning, more than any other management activity, has the greatest effect on reducing risk of destructive wildland fires. It reduces fuel loads, reduces fire intensity, increases fire control efficiency, and results in less resource damage when a wildland fire occurs. Most importantly, it offers the fire manager more options for appropriate management response to wildland fire, especially concerning wildland fire use for resource benefit.

Table 3-119 displays the estimated annual prescribed fire condition class 1 objectives by alternative, for the 10-year period.

Table 3-119. Estimated annual prescribed fire condition class 1 objectives by alternative, for the 10 year period.

	Alternative F (current)	Alternative A	Alternative B	Alternative D	Alternative E	Alternative G	Alternative I
Low end	11500	9640	7669	10011	9444	4411	9514
Mid point	27869	23349	18660	24301	22962	10818	23122
High end	44238	37058	29650	38591	36479	17224	36730

Alternative F allows for the greatest acres of prescribed burning in order to meet 10-year condition class objectives for ecosystem management in the Sumter fire regimes. Alternatives A, D, E, and I have relatively the same effective burning acreage. Conversely, Alternative G allows for the least amount of management-ignited fire for ecosystem restoration.

“Fire spreads as a continually propagating process, not as a moving mass. Unlike a flash flood or an avalanche where a mass engulfs objects in its path, fire spreads because the locations along the path meet the requirements for combustion.” (Cohen 2000). Wildland fire does not spread to homes unless fuels are present to carry fire to the homes and the homes meet fuel and heat requirements sufficient for ignition and continued combustion. Removing hazardous fuels near homes in the wildland urban interface and building homes with fire resistant materials reduces the risk of ignition and combustion of the homes. Since we do not govern structural building materials in the WUI, we must concentrate on reducing hazardous fuels in their proximity, in order to reduce the risk of loss from a wildland fire.

According to the National Fire Plan, management-ignited fire will focus on treating hazardous fuels to reduce risk of unplanned and unwanted fires to communities and the environment, with priority given to wildland urban interface and then those in condition class 2 or 3. Specific details on meeting burn objectives will be contained in the Forest Fire Management Plan. Based on prescribed fire acreages being treated, Alternative F presents the highest potential to reduce hazardous fuels, restore fire dependant ecosystems, and decrease risk of catastrophic wildland fire to WUI. Alternatives A, D, E, and I allow for a considerable amount of fire in the ecosystem, but neither the most nor the least. Alternative G presents the highest risk to WUI due to untreated fuels in fire-dependent ecosystems.

General

Alternative F treats the most acreage by either prescribed burning or timber activities, in turn reducing potential negative effects from wildland fire. This alternative rates in the mid-range for potential risk of human-caused ignition due to increased access, but has the greatest percentage of unrestricted suppression area. Alternative F reduces the risk of negative effects of wildland fire more than all other alternatives.

Alternative G treats the fewest acres of both timber and prescribed fire, increasing the risk of catastrophic fire. This alternative has the least amount of trail and road access and the lowest potential of human-caused ignition.

Alternatives A, D, and I treat nearly the same amount of forested acres by either prescribed burning or timber. Though these alternatives do not allow for as many acres of fuel reduction or ecosystem management, they are better than any of the other alternatives from a fire management perspective.

Alternatives B and E rank just above Alternative G for the number of acres treated by either prescribed fire or timber management.

Infrastructure (Roads and Access)

Affected Environment

Access to the Sumter National Forest requires a transportation network suitable for the needs of the public as well as the commercial interests. This network includes the federal, state, county, and private access roads along with the Forest Service road system. The network currently totals 2660.4 miles of which 1052.9 are under Forest Service jurisdiction (see Table 3-120). The extensive state and county road network provides the primary access into the forest. The forest road system provides the final access to points of interest and to administer, manage, and protect the public lands and resources.

Many of the Forest Service system roads are within corridors that have existed for many years. An extensive system of developed and primitive roads was in place when the lands were acquired. Although past Forest Service road development activities have been mainly to meet timber resource demands, the resulting system provides a broad range of access and levels of service to all users and visitors to the forest. Nearly all arterial and collector forest system roads are in place on the forest. The improvement and upgrading of these higher-level forest roads to meet current vehicle use would be an integral part of the proposed public forest service road program.

Table 3-120. Transportation Jurisdiction

TRANSPORTATION JURISDICTION					
	Functional Classification (MILES)				
Jurisdiction	Arterial	Collector	Local	Total	Percent
State/Federal	737.5	572.3	59.5	1369.3	51.5
County		107.1	122.9	230.0	8.7
Private			8.2	8.2	0.3
Forest Service	28.0	100.9	924.0	1052.9	39.5
Total Miles	765.5	780.3	1114.6	2660.4	100
% By Functional Class	28.8	29.3	41.9	100	

Forest management objectives for the road system are to operate the minimum network of roads that provide for user safety first with convenience and the efficient accomplishment of the forest's land and resource management objectives. Roads in the forest system are classified using a number of characteristics. The network status is classified by the designation of a road as arterial, collector, or local (see Transportation Jurisdiction Table 3-1). Arterial roads are through-roads that generally connect to a state or county road. Connector roads funnel traffic to arterial roads from blocks of forestland. Local roads serve limited areas or sites and generally connect with collector roads. The forest currently has jurisdiction to improve, maintain, and control approximately 40% of the roads and most of these are in the local category.

Forest Service roads are planned and maintained based on a road management objective. Road management objectives consider the vehicle type, traffic safety, cost of transportation, and impacts to land and resources. Traffic service levels are defined for each road to characterize the degree of service the road will offer and the type vehicles expected to use the road (Table 3-121). A major component of the traffic service level is the road surface material. The road system surfacing distribution is shown in Table 3-122.

Table 3-121. Traffic Service Levels

Traffic Service Levels (Miles)				
A	B	C	D	Total
-	64.9	677.1	310.9	1052.9

Table 3-122. Road Surfacing Types

Road Surfacing Types (Miles)				
Paved	Gravel	Improved	Native	Total
5.7	731.2	96.2	219.8	1052.9

National forest roads are maintained to assure planned service levels and user safety are preserved and that impacts to soil and water resources are kept to a minimum. Each road in the system is assigned a road maintenance level based on the road's management objectives. Roads in maintenance level 1 are closed to vehicular traffic and receive only custodial care to protect resources. Maintenance level 2 roads are generally for high clearance vehicles and are unsuitable for cars. Maintenance level 3, 4, and 5 roads receive routine work to assure a safe, efficient and travelable road. The forest maintains the system mainly through service contracts but does some construction contracts for more extensive restoration work. The forest currently is able to do some level of maintenance annually on only 80% of the system roads due to budget limitations. The forest maintains less than 40% of the system to the current road management objective level. The maintenance level distribution of roads on the forest is displayed in Table 3-123.

Table 3-123. Operational Maintenance Level

Operational Maintenance Level

Level	Miles
1	399.6
2	43.8
3	506.3
4	97.9
5	5.3
Total	1052.9

The forest has a close working relationship with many of the counties containing national forest land. Road cooperative agreements for the development, maintenance, and operation of selected roads of mutual interest are in place with the counties. Certain roads under state or county jurisdiction, which serve the mutual transportation needs of the public and forest, are designated as forest highways. These designated roads are eligible for Federal Highway Administration rehabilitation and reconstruction funding, including bridge replacement. Currently the forest has 412.64 miles of designated forest highways.

Commercial use of forest development roads is prohibited without a road use permit or authorization. Commercial users are responsible for their commensurate share of road maintenance either through deposits or performing the actual maintenance work.

Future Management

The development, management, and operation of the forest road system would continue as needed to respond to public use and resource management objectives. Any road determined to be needed, as a permanent facility would require periodic improvements and maintenance activities. Existing road cooperative agreements would be maintained and improved to continue participation with other agencies or local governments in accomplishing work on roads of mutual benefit. However, annual road maintenance is expected to continue to fall short of all of the system needs.

The forest's arterial and collector road needs are generally in place. These roads would require extensive restoration and improvement to assure they meet the continuing transportation demands of forest traffic. Existing local roads would continue to be managed to meet the demand for limited and intermittent access. Roads causing adverse impacts to the adjacent environment would be relocated where possible, stabilized to mitigate the effects, or decommissioned. In areas where current access does not exist, minimum design-standard roads would be planned with full public participation prior to

construction. Bridges and large drainage structures would continue to be inspected to meet national inspection requirements. Depending on funding availability, these structures would be rehabilitated, replaced, or closed as required to maintain user safety. Recreation facility road requirements would be planned, reconstructed, or constructed to meet the traffic vehicle and user demands.

The forest road maintenance appropriated funding has not kept pace with the increased contract and administration costs. Greater mileage of the system may be placed in the lower maintenance levels with even more road miles closed to vehicular traffic. Road management decisions would be accompanied by a “road analysis process” for the area under consideration in any decision document.

All roads would continue to be inventoried and scheduled condition surveys conducted. Decisions would be made about the intended continued use of a road. Based on the desired future condition, certain roads may be decommissioned and obliterated, closed for only intermittent use, or restricted to use during certain periods. Road decommissioning would continue to eliminate both system and non-system roads that are no longer required.

Traffic management methods would be applied to roads according to their intended use and to insure the safety of the user. These methods would incorporate road closure devices, orders restricting or prohibiting use, signing, and law enforcement.

Direct, Indirect and Cumulative Effects

The forest transportation system provides access to the forest for administrative management, hunting, fishing, timber harvest, sight seeing, and numerous other activities. Most Forest Service road development and operation activities will be associated with the local forest system roads. Roads – in particular new construction and reconstruction—have a multitude of direct, indirect, and cumulative effects on nearly all environmental components. Travel restrictions and road decommissioning may occur on the transportation system within certain areas of the forest to protect soil and water resources, reduce wildlife disturbance during certain seasons, and resolve user conflicts. Table 3-124 displays the effects for the first period of all the alternatives on road management.

Table 3-124. Effects of Alternatives on Transportation Management for Period 1

Effects of Alternatives on Transportation Management for Period 1								
Indicator Roads	Unit of Measure	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Constructed	Miles/Yr	0.8	1.0	0.8	0.7	1.1	0.5	0.9
Reconstructed	Miles/Yr	34.0	39.3	31.9	28.9	43.4	21.7	34.2
Total	Miles/Yr	34.8	40.3	32.7	29.6	44.5	22.2	35.1
Maintained	Miles/Yr	845.0	835.0	845.0	835.0	835.0	835.0	845.0
Decommissioned	Miles/Yr	7.0	7.0	7.0	7.0	7.0	7.0	7.0

Effects of Recreation on Transportation Management

Travel, whether by car, OHV, horse, or by foot is fundamental to the enjoyment of the national forest. Recreation travel by car is the fastest growing segment of forest traffic. The forest recreation strategy of emphasizing our dispersed opportunities would only cause this segment to increase more on our forest. Recreation traffic volumes create a demand for generally higher standard roads -- for example, double lane or wider single lane, accommodation of higher travel speeds, smoother roadway surfaces, or greater visibility.

The recreation strategy of emphasizing the dispersed nature of the forest would have significant impacts on Alternatives A, D, E, and I. Driving for pleasure would continue to generate the highest traffic and create a demand for a higher standard, well-maintained road. The greatest impact on roads may come from hunting traffic during the big game seasons of fall and winter. The impact to maintenance during this wet season use from road rutting and surfacing loss into ditches can be significant. Public demand for a quality hunting experience also creates demands to open or close roads to motor vehicles depending on the type of hunt and time of year.

Recreation use can be expected to continue to increase over time in most categories. The developed recreation facilities would only see expansion in Alternatives A and D. This minor increase in capacity would have little effect on the forest transportation system in comparison to the effects of dispersed recreation traffic. The developed facilities would continue to require that a number of roads be reconstructed and improved to meet traffic and vehicle demands. Projected budgets, based on current allocations, would not be adequate to meet many of these needs.

The potential for crowding, user conflicts, and reduction in the quality of the experience would increase with more recreation demand. These demands could cause the roads to

require more restoration work rather than maintenance. Recreation would require a certain number of roads be reconstructed and maintained to a higher standard in all alternatives.

Effects of Soil and Water on Transportation Management

Soil properties and topography vary a lot among the many different geographic locations on the forest. These factors have a tremendous effect on the location, design, maintenance, and operation of roads on the forest. The climatic conditions in relation to the period of heaviest usage have a direct impact on the soil and water effects from the roads.

The high clay and mica contents of some soils on the Enoree and Long Cane Ranger Districts create less stable roadbeds and ditches. These soils require higher standard roads for such resource activities as timber harvesting and hunting. The roads would need more reconstruction and maintenance to prevent excess soil movement. Maintenance activities can also create soil movement by grading out the fine material to the surface. These fines are then subject to action from rain to wash into the roadside ditches.

The impacts from all alternatives would be less than the current management situation due to the reduction in harvest acres. The impact would be highest from construction and reconstruction under Alternatives B, F, and I. The impact from road maintenance would be significant under Alternative E due to increased recreation traffic.

Sound design, construction, and reconstruction practices can partially mitigate the effects on soils from roads. Avoiding locations of poor soils, slope and ditch stabilization, and surface stabilization can reduce impacts to soils from roads. The proposed public forest road program would reduce some of the highest deferred maintenance backlog needs on the forest effecting soil and water concerns.

Effects of Vegetation Management on Transportation Management

Timber harvesting activities would require road construction and reconstruction under all alternatives for all periods (Table 3-5, Effects of Alternatives on Transportation Management for Period 1). The miles of road impacted generally increases from period 1 to period 2. Alternatives B, F, and I would have the highest projected impact on the road system in period 1. This work would have both direct and indirect effects to the transportation system.

Past timber harvest acres were used to develop a roadwork coefficient to estimate the miles of construction and reconstruction. This coefficient, based on more even-aged management, may not have allocated significant miles due to the new emphasis on uneven-age management. The actual miles of construction and reconstruction would be

determined by the available acres for harvest and a site-specific analysis. The higher acres for uneven-aged management harvest in Alternatives B, F, and I may require some increase in road mileage development and maintenance.

Timber hauling produces observable physical effects on roads. Numerous trips by heavy log trucks create wear on the road subgrade and surfacing. These impacts can also affect soil and water by causing soil movement into roadside ditches. This wear and erosion can lead to roadbed failures creating the need to reconstruct the road.

Timber harvesting also has an indirect affect on forest roads. Larger haul volumes or longer hauling distances require more cooperative road maintenance fund collections. This results in the forest's increased ability to maintain more road miles to standard. All alternatives project a decrease in the first period from current levels, which would require more appropriated funding to maintain the current road management level. This reduction in funding may require limiting maintenance or access to some areas.

Vegetation management in road right-of-way is a critical factor due to climatic conditions on the forest. The type, species and especially the amount of vegetation are critical in maintaining the safety of the traveling public. The improper maintenance of vegetation can lead to the acceleration of erosion along roadway slopes and ditches.

The emphasis on protection of threatened and sensitive plants and planting of native species is increasing the cost of road maintenance and restoration work. The timing or elimination of some ditch maintenance work is having only minor effects on the environment. The requirement to eliminate invasive species and plant more native species may in time reduce the cost of some vegetation management practices. The alternatives with the most roadwork would see the heaviest impact from vegetation manipulation.

Effects of Wildlife on Transportation Management

Wildlife management has a heavy impact on the forest road system. These impacts are both positive and negative. The impact from hunting on road maintenance is due to the heavy use during the wettest part of the year. The impact from Alternative E would affect roads the most due to the emphasis on recreation.

The planting of closed roads for wildlife openings would help maintain the roadbed during long periods of nonuse. Protection of some species during nesting season would require the closure of some roads, reducing road maintenance costs. Protection of species may also require limiting of maintenance activities that could adversely affect road and ditch stability.

SOCIAL AND ECONOMIC ENVIRONMENT

Affected Environment

The Sumter National Forest includes approximately 362,000 acres of National Forest System land in the mountains and piedmont of South Carolina. The Forest is divided into three ranger districts located in 11 counties. The Andrew Pickens district is located in western Oconee County. The Enoree District is located east of Interstate 26 in Chester, Fairfield, Laurens, Newberry and Union Counties. The Lone Cane District lies east of J. Strom Thurmond Lake in Abbeville, Edgefield, Greenwood, McCormick and Saluda Counties.

The USDA Forest Service along with many other federal areas completed a broad assessment of this region in 1996, known as the Southern Appalachian Assessment (SAA). One of the components of this analysis is the "Social, Cultural, and Economic Technical Report", where a social and economic assessment of the southern Appalachian lands was performed. The following assessment of the Sumter National Forest is tied to some of the more significant SAA findings. An attempt is made to contrast the Forest's environment with similar findings from the southern Appalachian lands. The following SAA topics will be presented in this forest's assessment:

- I. Demographic (social) Changes
- II. Economy Trends
- III. Demographic Changes Effect on Natural Resource Management
- IV. Impact of Natural Resource Management on the Economic and Social Status of Local Communities
- V. Influence of Publics Outside Southern Appalachia and their Effect on Management of Ecosystems and Public Land
- VI. Values and Attitudes of Southern Appalachia Residents Toward Natural Resources and Ecosystem Management
- VII. Priorities for Management of Private Land by Non-industrial Owners

Social attitudes, values and beliefs are elements used to describe and understand the human dimension of resource management. This information is used to predict possible effects on local communities. These effects may include acceptance of or resistance to the decisions made. Social analysis coupled with economic demographic information forms the human dimension of ecosystem management. This information is used with the biological and physical analysis to best understand potential effects on the land as well as the human environment.

Demographic Changes

Past population growth and various racial and ethnic components of the population within the counties which comprise a national forest are characteristics of an area used to determine how dynamic and subject to change it may be in the future. A static area generally implies fewer possible issues and conflicts for land managers to consider. Conversely, a dynamic growing population or changes in population characteristics may produce many conflicting issues for consideration. Certain areas of the National Forest System and surrounding lands may be very attractive for second homes or retirement home residences. This attraction to urban dwellers in the surrounding communities may produce issues which conflict with traditional residents of the area.

Demographic changes for the Analysis area (Sumter National Forest boundary counties) and the Southern Appalachian Region Assessment (SAA) are presented first in the analysis. Then a contrast is made between the SAA region, the Forest and the State in which the Forest resides. Many of the time frames used in the Assessment were not available for the Forest, and more current data than 1990 were not available in the Assessment. Therefore, direct comparisons between the two are not always possible. Some limited 2000 Census data is available from the SF 1 count (mostly population, households and housing data from the "short form"). To the extent available these data are used in the analysis.

The Sumter NF analysis area is all eleven counties that have any Sumter NF system lands within its boundaries. Reference to the Forest or the Forest area in this report relates to the eleven-county study area unless specifically stated otherwise,

Population increased by 7.3 percent from 1980 to 1990 in the Southern Appalachian region. This compares with 8.1 percent for the Sumter NF, and 11.7 percent for the state in which the forest resides. More currently, the change from 1990 to 2000 was 12.4 and 11.5 percent, respectively. Tables 1-5 in Appendix I show population characteristics and their rates of change for each county within the Forest proclamation boundary, while Table 3-125 illustrates significant population variable changes from 1980 to 1990, and 1990 to estimated 2000 values on all the counties within the NF boundary.

Table 3-125. Minority Representation and Percent Population Change

MINORITY REPRESENTATION AND PERCENT POPULATION CHANGE				
	1990 % Minority	Population % change '80-'90	2000 % Minority	Population % change 1990-2000
Forest Counties	31.7	8.1	32.4	12.4
South Carolina	30.9	11.7	32.8	11.5
SAA	8.1	7.3	*	*

* No SAA number for 2000

Source: U.S. Census Bureau

Minorities made up approximately one-third of population within the Forest area and at the state level in 1980. The minority population continued to represent about 30-33% of the total in 1990 and 2000. Opportunities for forest visits by minorities has been very substantive since the 1970's, but has not changed much through time. The minority population in the SAA was lower than for the Forest counties or South Carolina, with 8.1 percent in 1990.

Population density in the SAA and the State of South Carolina was 102 and 116 persons per square mile, respectively, in 1990 (see Table 3-126). This was nearly twice the number of persons per square mile in the Forest area which had a density of 60. A decade earlier the same general relationship existed with densities of 94, 104 and 55 for the SAA, State and Forest, respectively. In 2000 the State and Forest density had increased about 12 percent to 133 and 67 but the relationship of the State which was nearly double the Forest density in 1980 did not change.

Table 3-126. Population Density

POPULATION DENSITY			
	1980 Population Density Persons/Sq. Mile	1990 Population Density Persons/Sq. mile	2000 Population Density Person/Sq. Mile
Forest Counties	55.3	59.8	67.3
South Carolina	103.6	115.8	133.2
SAA	94	102	*

* No SAA number for 2000

Source: U.S. Census Bureau

The Forest and State are very similar in their minority representation and have a much higher representation of minorities than the larger SAA. The Forest, however, deviates substantially from the SAA and the State of South Carolina, with regards to population density. This is due to the absence of large metropolitan areas in the Forest area. This divergence can be expected to continue in the near future.

The low population density for the Forest is consistent with the rural representation of the population in the Forest county boundaries relative to the State and SAA. The percentage of persons living in rural areas in Forest counties was 68.5 percent in 1980 and increased to 72.5 percent in 1990 (see Table 3-127). This is in contrast to the lower percentage of approximately 45 percent for the State in both 1980 and 1990. The SAA had a rural character with 53.0 percent classified as rural in 1990, which was greater than South Carolina, but much less rural representation than for the Forest. All Forest counties reflected a strong majority rural population in both 1980 and 1990 (see Table 6 of the Appendix I). One county, McCormick, was shown to have 100 percent rural population in 1980 and 1990.

Table 3-127. Rural Representation

RURAL REPRESENTATION		
	1980 % Rural	1990 % Rural
Forest Counties	68.5	72.5
South Carolina	45.9	45.4
SAA	*	53.0

* No SAA number for 1980

Source: U.S. Census Bureau

All Forest counties had a rural representation of 65 percent or more in 1990. Greenwood County had the lowest rural representation (65.1%) in the Forest analysis area and also had the highest population density, being nearly double the Forest county average (see table 5 of the Appendix I).

The Sumter NF analysis area exhibited some population growth in the decade of the 1980's and this growth trend grew stronger in the 1990's. Growth was in both rural and urban areas, but appears to slightly favor the rural area at least in the decade of the 1980's. Union County is the only Sumter NF analysis area county that did not reflect a positive population growth trend. McCormick County, which was 100 percent rural, grew much faster than the average analysis area county in the 1980's and matched the average county growth trend of the 1990's.

Per capita income is a relative measure of the wealth of an area. It constitutes the personal income from all sources divided by the population of the area. In the Forest

analysis area 1990 per capita income averaged \$10,191 compared to \$11,897 in the State of South Carolina and \$10,950 in the SAA (see Table 3-128).

Table 3-128. Per Capita Income

PER CAPITA INCOME			
	1980 Per Capita Income	1990 Per Capita Income	Real Avg. Annual % Change '80-'90 Per Capita Income
South Carolina	\$5,884	\$11,897	2.4
Forest Counties Avg.	\$5,230	\$10,191	2.1
SAA	\$6,377	\$10,950	0.8

Source: U.S. Census Bureau

Income for both the Forest area and South Carolina grew faster on a real basis (inflation adjusted) than the SAA during the 1980's. The Sumter NF grew at a 2.1 percent annual rate, compared to a slightly faster rate of 2.4 for the State and a much slower, 0.8, rate in the SAA. All individual counties in the Forest had positive per capita growth rates ranging from 1.2 to 3.5 percent (see table 7 of Appendix I).

Table 11 of the Appendix I summarizes income data for the Forest and State based on Bureau of Economic Analysis (BEA) measurements. This data is per capita personal income, which is not directly comparable with the Bureau of the Census per capita income data shown in Table 7 of Appendix I. The two data sets differ because Census data is obtained directly from households, whereas the BEA income series is estimated largely on the basis of data from administrative records of business and governmental sources. The definitions of income are, also, different. Caution must also be used in comparing growth rates of Table 7 with Table 11 because growth in Table 7 is based on real or inflation adjusted dollars while growth in Table 11 is based on nominal dollars (unadjusted for inflation).

The Sumter NF can be characterized as a relatively poorer area than the State of South Carolina or the SAA. The growth rate during the 1980's left the Forest further behind when compared to the State but showed substantial gains compared to the SAA. Information for 2000 was not available, but the continuation of these growth trends in the 1990's would result in the Forest reaching comparability with the SAA by the year 2000.

The percent of the workforce out of work is another indicator of relative economic prosperity. Unemployment rates change dramatically over time, depending in large part on the national and regional economy. Some areas, however, have protracted unemployment problems because of educational attainment and lack of skills.

In 1990 the Forest had an unemployment rate of 6.1 percent (see Table 3-129), a higher rate than for the State (4.7%), but slightly less than existed in the SAA (6.5%). The unemployment rate for the Forest in 1997 was 5.4 percent and, again, was nearly one percentage point above the statewide rate. More resolution in unemployment rates for the Forest by county can be found in Table 7 of the Appendix I for 1980 and 1990 and in Table 12 of the Appendix I for 1997.

Table 3-129. Unemployment Rate

UNEMPLOYMENT RATE		
	1990 Unemployment % Rate	1997 Unemployment % Rate
Forest Counties	6.1	5.4
South Carolina	4.7	4.5
SAA	6.5	*

* No SAA number for 1997

Source: U.S. Census Bureau

Percent of people living in poverty is another population characteristic which provides an indicator of relative economic prosperity of an area. A substantial number of persons in the Forest area are classified as living in poverty. This statistic was 16.3 percent in 1989 and 16.4 percent in 1995 (see Table 3-130). The data for South Carolina was slightly lower, 15.7 percent in 1989 and 15.4 percent in 1995. Data for the SAA is only available for 1989, but reflects a much lower rate of 11.0 percent. Information for individual Forest boundary counties is presented in Appendix I Table 8 and presents a wide range between counties from 11-23 percent. Counties on the high end of the range in 1995 were also on the high end of the range in 1989 indicating that this is a persistent characteristic of the Forest area.

Table 3-130. Poverty Rate

POVERTY RATE		
	1989—Percent of People of All Ages in Poverty	1995—Percent of People of All Ages in Poverty
Forest Counties	16.3	16.4
South Carolina	15.7	15.4
SAA	11.0	*

* No SAA number for 1995

Source: U.S. Census Bureau

The percent of households headed by a female member can be a factor that contributes to relative poverty and relates to social disunity for an area (see Table 3-131). The greater this percentage is, the higher the number of households that may be on some form of government assistance.

Table 3-131. Percent of Female Head of Households

PERCENT OF FEMALE HEAD OF HOUSEHOLDS		
	1980 Female Head of Households	1990 Female Head of Households
Forest Counties	6.2	7.5
South Carolina	6.9	7.5
SAA	*	10.5

* No SAA number for 1980

Source: U.S. Census Bureau

Female-headed households increased substantially in the 1980-90 decade at the Forest and State level. The Forest had a lower level of female head of households in 1980 (6.2%), but increased to the same level as the State of South Carolina by 1990 (7.5%). Both the Forest and the State were substantially below the 1990 level of 10.5 % for the SAA.

The number of persons per household in the decade of the 1980's and in the 1990's was very similar between the Forest and the State (see Table 3-132). The trend was for decreasing household size; declining from 3.0 persons in 1980 to 2.5 persons in 2000. Information for the SAA was only available for 1990, but the Forest and State were very comparable to this larger area at that time.

Table 3-132. Household Density

HOUSEHOLD DENSITY			
	1980 Persons per Household	1990 Persons per Household	2000 Persons per Household
Forest Counties	3.0	2.7	2.5
South Carolina	2.9	2.7	2.5
SAA	*	2.6	*

* No SAA number for 1980 and 2000

Source: U.S. Census Bureau

The decade of the 1970's reflected substantial growth in housing units at both the Forest and State levels (see Table 3-133). This trend continued at a slower pace in the 1980's

and then picked up again some in the 1990's, but not equal to the growth rate of the 1970's decade. The three statistics population growth, housing density and housing units are directly related. In the 1990's Forest population increased 12.4 percent (presented above) and persons per household declined from 2.7 to 2.5. This would imply that the number of housing units increased faster than population growth. This seems to be the case as seen in the table below which shows a 21.7 percent growth in the 1990 decade while population increased 12.4 percent. Growth rates for housing in the Forest area substantially trailed that of the State through the decade of the 1970's and 1980's. In the 1990's the growth rate of the Forest area was only 1.4 percent behind the State.

Table 3-133. Housing Units

HOUSING UNITS			
	Housing Units Percent Change	Housing Units Percent Change	Housing units Percent Change
	1970-80	1980-90	1990-00
Forest Counties	26.9	16.7	21.7
South Carolina	41.5	23.5	23.1

Source: U.S. Census Bureau

Median housing values for the three areas are contrasted in Table 3-134. Housing values in the Sumter NF are substantially below the values for the SAA and the State of South Carolina. Housing values are determined principally by the extent of demand. The greater the demand, the higher prices are bid up. Population and job increases play a factor in the extent of demand for housing. Another factor is land and building costs. Land cost in the more rural Forest setting would generally be less than in a more urban area. The median value of housing on the Forest was \$27,555 in 1980 and increased to \$46,236 in 1990. The comparable values for South Carolina were \$35,100 and \$61,100. The values for the SAA were less than the State but higher than the Forest. Information by individual Forest area Counties is shown in Appendix I Table 10.

Table 3-134. Housing Value

HOUSING VALUE		
	Housing Units Median Value	Housing Units Median Value
	1980	1990
Forest Counties	\$27,555	\$36,236
South Carolina	\$35,100	\$61,100
SAA	*	\$59,700

No SAA number for 1980

Source: U.S. Census Bureau

Economy Trends

Analyzing the major sectors of an economy allows insight into how diverse the economy is and what industries may be driving its growth (see Table 3-135). Table 13 of the Appendix I shows the entire economy broken out by major Standard Industrial Code (SIC) industries and by important industry sub-sectors for wood products and for an estimate of the contribution of certain industries to tourism. Table 13 shows the nine major one digit SIC's in bold print.

Table 3-135. Economic Diversity.

ECONOMIC DIVERSITY				
Sector	Industry Output		Employment	
	% of Total 1985	% of Total 1996	% of Total 1985	% of Total 1996
Manufacturing	56.6	54.0	41.9	33.5
Lumber & Wood Prods.	2.8	3.4	2.5	2.2
Wood Furn. & Fixtures	0.0	0.1	0.0	0.1
Paper & Pulp Prods.	0.3	0.2	0.2	0.1
Total Tourism	0.8	0.7	1.4	1.7
Total Economy*	\$8,652.3	\$14,907.4	139,366	175,568

* Dollars in Millions and number of employees

Source: IMPLAN Data, 1985 and 1996

Manufacturing is a dominate sector in the Forest economy, but declined in importance between 1985 and 1996 with respect to both industrial output and employment. This sector represented 54 percent of industrial output and 33.5 percent of the Forest area employment in 1996. As the manufacturing sector declined other sectors have expand thereby making the economy more diverse.

The larger SAA economy had 42 percent of industrial output associated with manufacturing in 1991. This reflects a slightly more diverse economy than existed in the Forest area. Both the SAA and the Forest have a concentration in manufacturing much higher than the 20 percent level of the U.S. economy as a whole.

Within the manufacturing sector, wood and wood-related products (lumber, furniture & fixtures and pulp & paper) represented 3.7 percent of the local economy's total output in 1996. This was a small increase over the 3.1 percent wood and wood-related products represented in 1985. Employment in the wood and wood-related sub-sectors was essentially unchanged at about 2.5 percent in 1985 and 1996.

Tourism is defined as any non business- related travel of 100 miles or more from home. Recreation would be a subset of the tourism estimate; therefore, its share of the economy would be something less than the tourism numbers. Recreation in a local rural area is a major part of the tourism estimate and presents the best estimate of the importance of recreation available.

The estimate of tourism's share of the economy was about the same for output in 1985 and 1996. Employment, however, increased from 1.4 percent in 1985 to 1.7 percent in 1996. Further comparison of all nine sectors of the Sumter NF analysis area economy is presented in Table 13 of the Appendix I.

Besides the manufacturing changes discussed above, other changes include construction increase from 4.1 percent of output in 1985 to 6.1 percent in 1996; finance, insurance and real estate increase from 3.9 percent to 5.5 percent and the services sector, non tourism related, increase from 5.4 percent to 7.5 percent in 1996. Agriculture and wholesale and retail trade sector, non-tourism related, were two sectors that reflected slight declines between 1985 and 1996. With these changes the local economy is becoming more diverse, but remains heavily reliant on the manufacturing sector for a major part of the economic activity.

For the purpose of economic analysis, in the Southern Appalachian Assessment, the years of contrast were 1977 and 1991 from the IMPLAN input-output model (see Table 3-136). In the Forest analysis more current data were used, which contrasts a 1985 regional economy with the one found in 1996. Because these years are dissimilar, many of the percentage changes are not directly comparable. Determining an average annual rate of change for both data sets does allow for a relative comparison measure. The following chart compares the rate of change between the SAA's economy and the Sumter NF analysis area.

Table 3-136. Economy Dynamics

ECONOMY DYNAMICS		
	Employment Avg. Annual % Change	Industrial output Avg. Annual % Change
Forest Counties*	2.1	5.1
SAA**	1.9	2.6

* Change from 1985 to 1996

** Change from 1977 to 1991

Source: IMPLAN 1985 and 1996 Data

The average annual growth in industrial output in the Forest area (5.1%) is nearly twice the growth rate for SAA (2.6%). Change in employment in Sumter NF area is slower than for output (2.1%) but faster than for employment growth in the SAA (1.9%). The

faster growth rate for output compared to employment in the Forest and SAA suggests that both areas have invested in capital equipment that provides productivity gains which result in higher levels of output growth relative to employment growth.

A principal way an economy grows is by exporting goods and services. Most typically, manufacturing activity is thought of as providing most of this export-related activity. However, services and retail trade can be considered “export” industries if significant visitors come in from outside the analysis area and participate in travel-related activities to bring in new dollars. In this context tourism can be classified as an export-driven activity. A manufacturing industry can be a net importer if it imports more of a commodity than it exports.

The level of net exports for sectors in the IMPLAN analysis is presented in Appendix I Table 14. In this table the tourism detail is presented. Table 3-137 compares a summary of tourism and other selected sectors in the Sumter NF analysis.

Table 3-137. Exporting Industries

EXPORTING INDUSTRIES				
Commodity	Net Exports* (Exports Less Imports)		Net Exporting Industries as a Percent of Total	
	1985	1996	Positive Exporting Industries 1985	1996
SELECTED MFG.				
Lumber & Wood Prod.	\$125.8	\$277.5	-6.7	10.0
Wood Furn. & Fixtures	-\$21.0	-\$35.9	0.0	0.0
Pulp & Paper Products	-\$109.8	-\$161.6	0.0	0.0
Total Manufacturing	\$1463.2	\$2291.3	77.9	79.8
Tourism Trade-Estimate	-\$22.5	-\$45.4	0.0	0.0
EXPORTS				
Total Net Trade	-\$645.1	-\$1324.0		
Total Positive Trade Ind.	\$1877.2	\$2772.8		

*Million Dollars

Source: IMPLAN 1985 and 1996 data

Table 3-137 shows that this local economy was a net importing economy in 1985 (-\$645.1 million) and became more dependent on imports in 1996 (-\$1342.0 million). The change that has taken place in the wood and wood-related product industries is reflected above. The “Lumber & Wood Prod.” Sub-sector was the only wood and wood-related products sub-sector that was a net exporter (\$125.8 million in 1985). This sub-sector increased its net exports (\$277.5 million) in 1996.

The other two sub-sectors “Wood Furn. & Fixtures” and “Paper & Paper Products” were net importers in 1985 and became larger net importers in 1996. Total manufacturing was

a net exporter in 1985 and increased its net exports level in 1996. Tourism was a net importer in both time periods.

The sum of all sectors or sub-sectors, when sub-sector detail is provided, with a positive net export value (“EXPORTS-Total Positive Trade Ind.” in Appendix I table 14) provides the basis for determining a commodities share of total net exports. This computation is only valid for sectors or sub-sectors which are net exporters (positive values).

Manufacturing in 1985 had net exports of \$1463.2 million and this was 77.9 percent of the \$1877.2 million for all net exporting industries in the Forest area. The only other major sector that reflected positive net exports was “Transportation & Utilities” and the “Government” sector. “Finance, Insurance and Real Estate” and “Services—Non-Tourism” were two sectors with large net imports contributing to a drain of money from the local economy. The sub-sector estimate for tourism suggests that spending in the analysis area by travelers coming from outside the Forest areas was less than expenditures of residents traveling outside the area. Further, net imports in this sub-sector actually increased between 1985 and 1996.

The Sumter NF analysis area can be contrasted with the SAA area, which was a net exporter in 1991 of goods and services of \$25.5 billion. Manufacturing was the largest net exporting sector, representing \$24.6 billion. Thus, manufacturing represented 96.5 percent of the net exporting sectors in the SAA. Construction (-\$6.7 billion) and Services (-\$4.3 billion) were the largest net importers and contributed to a drain of money from the SAA economy.

The Sumter NF analysis area economy was a net importer in 1985 and increased in net imports in 1996 to a negative \$1,324.0 million. Manufacturing dominated the positive trade industries. “Lumber & Wood Products” was an important sub-sector of manufacturing with regards to positive trade.

Another way to indicate diversity of an economy is with the Shannon-Weaver Entropy Indices of diversity. This process allows a relative measure of how diverse an area is with a single numerical index. The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries. All indices range between 0 (no diversity) and 1.0 (perfect diversity). These two extremes would occur when there is only one industry in the economy (no diversity) and when all industries contribute equally to the region’s employment (perfect diversity). In most cases diversity would be registered somewhere between these two extremes. Another factor affecting the magnitude of the index is the number of industries in a local economy: the more industries, the larger the index.

The Shannon-Weaver Entropy index is presented for all Forest counties in Appendix I Table 18. The indices contrast the change in diversity from 1977 to 1993 at the four digit SIC level, or at the industry level. Indices for South Carolina and the United States are presented as comparison guides. In Table 3-138, selected counties are presented for comparison.

Table 3-138. Shannon-Weaver Entropy Indices

SHANNON-WEAVER ENTROPY INDICES		
Forest Boundary Counties	1977 Four Digit SIC	1993 Four Digit SIC
Laurens	0.51683	0.63186
McCormick	0.37419	0.51513
Newberry	0.52785	0.61425
Saluda	0.49949	0.53140
Forest Boundary Area (Weighted average)	0.45855	0.58773
South Carolina	0.59504	0.71523
United States	0.66483	0.73973

Source: USDA Forest Service, IMI

In 1977 McCormick County, South Carolina, was the least diversified and Newberry County was the most diversified within the Sumter NF analysis area. McCormick was 59 percent less diverse than the State of South Carolina. Newberry County was only 12.7 percent less diversified than the State in 1977 $[(.59504/.52785)-1]$.

Between 1977 and 1993 all Forest counties became much more diversified. McCormick County was the least diversified in 1977 and maintained this status in 1993. It was 38.8 percent less diversified than the South Carolina in 1993. This county improved its diversity standing by 37.6 percent between 1977 and 1993. Saluda County showed the least improvement in diversity between 1977 and 1993, increasing only 6.3 percent.

On a weighted average aggregate employment basis, the Sumter NF economy was about 29.7 percent less diversified than the South Carolina State economy in 1977 and about 22 percent less diversified in 1993. Laurens was the more diversified county in 1993 and was only 13.1 percent less diversified than the State of South Carolina.

In summary, the Sumter NF area economy is less diverse than the regional South Carolina economy, but these rural counties and the Forest area as a whole has become more diversified over the 16 year period analyzed. The Forest area has increased its diversity by about 28 percent compared to a 20 percent increase by the State.

Twenty-five percent of the monies received from natural resource consumption (25% Funds), such as timber harvesting, mining and recreation, on National Forest lands are paid to the counties with these lands. If these payments by the Forest Service do not amount to at least \$1.75 per acre, then Payments in Lieu of taxes (PILT) are used to address the shortfall. The PILT payment is administered by the Bureau of Land Management.

The level of these payments and trends over time are important to the individual counties involved. Trends in 25% Funds and PILT are important because declines or even slow growth can put additional pressure on the area tax base. Table 15 and 16 of Appendix I G provide information on revenues for each of the eleven Forest counties. The last year 25 percent funds information available is for 1997. Aggregate amounts and change from 1990-1997 is presented in Table 3-139.

Table 3-139. 25% Funds and Pilt Funds

25% FUNDS AND PILT FUNDS			
Forest County Area	1990	1997	% Change 1990-1997
25% Funds	\$1,337,606	\$1,020,541	-23.8%
PILT	\$ 44,190	\$ 42,715	-3.3%
Total	\$1,381,796	\$1,063,256	-23.1%

Source: U.S. Dept. of Interior

County revenues from 25 percent funds vary annually depending on timber harvest, mining and recreation use for that year. The trend over time has been down, however, because of a reduction in timber harvesting. PILT payments have not made up for the shortfall and there has been a decline in the total payment of 23.1 percent from 1990 to 1997. One reason for this is that PILT comes from Federal government monies specific to the program and appropriated prior to the availability of information on whether a shortfall will exit and if so its magnitude. Sometimes the appropriated money is inadequate to cover the shortfall. It would appear that this has caused a substantial decline in payments to Sumter National Forest Counties.

Recent legislation, Secure Rural Schools and Community Self-Determination Act of 2000 (PL106-393), provided counties with two options. They could continue to receive payments under the 25 percent fund payment process currently in effect or elect to receive their share of the average of the three highest 25 percent payments during the period of 1986 through 1999. The second option, called the full payment option, was selected by all Forest Area Counties. The 25 percent fund monies have continued to decline since 1997 and amounted to only \$544,500 in year 2000. When the full payment option takes effect the Counties will receive nearly \$2.2 million per year.

Land use and its change over time is an indicator of the dynamism of an area (see Table 3-140). Areas converting from rural uses to urban uses have implications of change that affect residents. The table below shows weighted average land use for the Sumter NF analysis area. All land uses, except urban, for 1982 and 1992 are presented. Urban land use comprises a small share of total land use and can be found along with characteristic of individual counties in the analysis area in Table 17 of Appendix I G.

Table 3-140. Land Use

LAND USE						
% Share						
	Forest		Farm		Residual	
	1982	1992	1982	1992	1982	1992
Forest Counties						
Weighted Ave.	17.3%	15.7%	63.9%	63.6%	16.0%	16.9%

Source: USDA Natural Resource Conservation Service

This data set from the Natural Resource Conservation Service includes federal land within the residual category. Residual also includes highways and power line access right of ways. Thus, changes in the "Forest" category reflect changes in private forest land and not National Forest Systems lands. This category has declined about 1.6 percent over the 10-year period. The urban share ranged from 2.9% in 1982 to 3.8% in 1992 (see Table 17 of the Appendix I). Only minor changes have occurred in any land use category between 1982 and 1992.

In the SAA it was found that little forest-land was lost between 1970 and 1990 in the analysis area. However, urban, road and housing development growth caused by increased population in the area decreased farmland, pasture, and open space. Retirees and commuters from nearby urban centers were responsible for part of that demand for development.

Summary of Demographic and Economy Changes

Population and economic dynamics are changing at a moderate rate within the Sumter NF analysis area. Population growth was slightly less than ten percent in the 1980's and increased to a growth rate of slightly over 10 percent in the 1990's. The Forest area population grew faster than the State between 1990 and 2000 but did not keep up with the State growth rate in the 1980's period.

The minority population in the Forest area was very similar to the State level of approximately 30 percent in both analysis periods--1980's and 1990's. This indicates no trend in net migration to or from the Forest area and the State as a whole. The percent of minority population is considerably above the national average of 13 percent. This suggests a relatively high opportunity for minority participation in local recreational endeavors.

A major difference exists between the Forest area and the State with regards to its rural character of the population. The Forest is much more rural, 100 percent rural in one county, and over 70 percent rural Forest-wide. Further, the Forest actually increased its

rural representation in the 1990's. The State as a whole realized a slight decline during this period.

The Forest area's economic health, as measured by per capita income, grew at a robust rate during the 1980's--2.1 percent per year, but this rate was not quite equal to the State rate of 2.4 percent. Average per capita income in the Forest was slightly less than the State in 1980. The gap was widened during the 1980's and The Forest was \$1700 behind in 1990. Unemployment decreased between 1990 and 1997, but remained substantially higher than for the State as a whole.

With a steady income growth rate and a downward trend in the unemployment, the area economy appears strong and stable. People with increasing incomes and adequate employment are likely to have the time and resources to pursue recreational activities. The national forest can be a prime outlet for some types of recreational activities.

The Forest poverty rate remained constant between 1989 and 1995. It was 1.0 percent above the State in 1995 and substantially above the SAA in 1989. Households with female heads increased between 1980 and 1990 but the rate was comparable to the State level in 1990--7.5 percent. These two characteristics are in a range that could detract from economic growth comparable to other areas. Household density, however, was 2.5 persons per household in 2000 which was very comparable to the State and SAA.

The Sumter NF analysis area's economy was very dependent on manufacturing in 1985 and became slightly more dependent in 1996, with 82.6 percent of it net exports coming from the manufacturing sector. As measured by total output in 1996, manufacturing was about 54 percent of the economy but substantially less if measured by employment--33.5 percent. Services and retail activity have gained in shares of the economic activity during this period. "Lumber and Wood products" was the only wood-related sector that gained in importance, from 2.8 percent to 3.4 percent. "Wood Furniture & Fixtures" and "Paper & Pulp Products" both declined. These three sectors make up the wood products manufacturing component of the economy and their share of the total Forest area economy was about 3.7 percent in 1996.

In general, economies that export more than they import are able to grow faster than those that are net imports. The Forest was a net importer (\$645.1 million) in 1985 and this level of net imports increased to \$1,324.0 million in 1996. Wood products and tourism are two sectors examined in more detail with regards to net exports. Tourism was a net importer in both 1985 and 1996. "Lumber and Wood Products" was a net exporter in 1985 and increased its net export level to \$277.5 million in 1996. "Wood furniture & fixtures" and "Paper & Pulp Products" were both net importers in 1985 and 1996.

A different indicator of economic diversity is the Shannon-Weaver Entropy indices. The index value ranges from 0.0 to 1.0 with 1.0 reflecting complete diversity. The Forest Areas had a Shannon-Weaver Entropy index value of .58773 in 1993. The State value for this period was .71523.

Land use changed very little between 1982 and 1992. The Forest area has lost about one and a half percent of the forest land cover in private lands. It is assumed that forested public lands are essentially unchanged during this period.

Thus, the Forest area economy and demography reflect a strong rural base. The economy appears healthy, but very dependent on manufacturing and not positioned for rapid growth. Population, housing, employment and income continue to increase which will generate some additional pressure for leisure time activities. The demand for such activities will not be as prevalent as would be expected in a more urban setting.

Demographic Changes Effect on Natural Resource Management

The Southern Appalachian Assessment found that while little forest land has been lost since 1970 in the region, urban, road and housing development growth, caused by increased population, has taken farmland, pastures and open space. Retirees and commuters from nearby urban centers are responsible for part of this demand for development.

Newcomers to the region feel differently than long-time residents about natural resource preservation. Often, the latter's livelihood depended upon manufacturing from natural resources. Managers of natural resources have had to respond to new sets of values and preferences, particularly increased demand from land and water resources for scenery, recreation and tourism.

Population in the region is projected to grow by 12.3 percent by 2010, slightly less than the growth rate expected for the nation (13.1 percent). Most of the growth is expected to be in northern Georgia, western North Carolina, and portions of eastern Tennessee and northwestern Virginia.

The increase in population density across all counties in the southern Appalachian region has impacted farms, forests, and pastures and has removed habitat for most species of wildlife and fish. More people entering the area has resulted in greater amounts of land conversion and impacts to water quantities, quality, and use. At higher elevations, development has impacted visual qualities.

As certain areas of the southern Appalachians have been developed, more urban pressures have impacted the land. Private lands have become posted as "off limits", causing public lands to become more crowded. This greater private land restriction, occurring in this area, has put more pressures on public land to accommodate increased demand for tourism and recreation.

The following analysis details the Sumter NF market area and presents estimates of the percentages of persons 16 or older fitting various personal and household profiles who live in the forest impact area. The results were taken from the "Public Survey Report, Public Use and Preferred Objectives for Southern Appalachian National Forests", Forest

Service, Southern Research Station, p.12. (see Table 3-141, below). A forest market area includes all counties within a 75-mile radius of the boundary of the forest. A subregion market area includes all the counties within the combined 75-mile radii of the forests covered by this report

As with the Sumter NF other forests in the SA region show little difference in characteristics than was found in the Sumter NF forest market areas.

Most people, age 16 and over, in the Sumter NF market areas live year round (96% to 97%), leaving only 3 to 4 percent being seasonal residents.

Between 36 and 40 percent of residents surveyed had lived in the areas within the Southern Appalachian Region their entire lives and between 49 and 53 percent had lived in those areas more than 20 years (percentages which include those who have lived there all their lives). Just over 30 percent had lived there less than 10 years, however, indicating a fairly sizeable portion of the population that has been mobile and a large contingent of recent immigrants. For people living in the Sumter market areas, a majority, over 53 percent, remain in the sub-region because of family ties. Very few, around 7 percent, remain for their job and only about 15 percent remain because of attachment to the area itself.

Around 12 percent of responding residents are owners of 5 or more acres of rural land. About 27 percent are under age 30, about 26 percent are over age 55. Most of the surveyed population are between the ages of 30 and 55. About 77 percent are non-Hispanic White, 17 percent are Black, and around 3 percent are Hispanic. About 2 percent are foreign born. Around 7 percent have less than a high school education and around 23 percent have a college degree. Well over 70 percent of persons 16 or older, therefore, have a high school diploma or a diploma and some college experience. About 63 percent work a job while over one-third are retired. More and more, the national forests with their natural and scenic amenities are seen as popular retirement locations.

Table 3-141. Percentage of local residents 16 or older by personal or household characteristic by forest, sub-region, and region-wide in the Southern Appalachians, 2002.

Personal and Household Characteristics	Sumter Market Area	Southern Appalachian Region Market Area
Year-round resident	97.5	97.2
Part-time resident	2.5	2.8
Percentage of residents in market area by state	GA 33.0 NC 24.8	GA 24.2 AL 21.4
	SC 23.7	TN 14.3
Lived in SA entire life	36.4	38.1
Lived in SA 20+ years	48.1	51.7
Lived in SA 10-19 years	20.7	19.0
Lived in SA <10 years	31.2	29.3
Remain in the SAs for job	6.9	7.4
Remain for family in the SAs	53.0	54.8
Remain for the SA area itself	14.8	14.6
Remain for other reasons	25.3	23.2
Own 5+ acres of rural land	12.2	13.1
Age under 30	26.8	27.2
Age over 55	26.3	27.3
White, non-Hispanic	77.1	74.5
Black, non-Hispanic	17.2	19.7
Hispanic	3.4	3.6
Foreign born	2.2	1.8
Education - 8 th grade or less	6.8	7.3
Education - Bachelor's degree/more	23.3	21.0
Work a job	63.1	59.9
Retired	39.6	39.5

Source: National Survey on Recreation and the Environment, Version 12, 11/2001 to 4/2002.

Management of Natural Resources' Impact on Economic and Social Status of Local Communities

The Southern Appalachian Assessment found that residents of communities near public land are sensitive to land management choices. Further, it found the region's communities are still in a lower economic status than surrounding state populations. Likewise, their economy is heavily dependent on natural resources than those of the states that comprise the southern Appalachians. Of particular concern to residents of the area, is the need to balance local interests to those interests of retirees, logging, and tourism.

For the Sumter NF market area increased population growth and development is changing the character of the landscape. Continuing growth and development is reducing the open space that is now farms, forests, and pastures. This development may reduce wildlife habitat, change the scenic character of the landscape, and increase the wildland/urban interface concerns.

Values and Attitudes of Southern Appalachia Residents Toward Natural Resources and Ecosystem Management

Natural resource management attitudes and values that residents of the SAA hold are extremely important for land managers to realize. Research done during the SAA analysis showed that most people felt that environmental protection and economic growth can be compatible. However, when people had to choose between the two, their first choice was the environment. Most people felt that environment protection has **not** gone far enough. SAA residents have indicated a willingness to put more personal funds toward collective environmental protection.

Furthermore, the SAA found that as retirees, urban transfers, and other new residents move into the SAA region, concerns for the health and aesthetic appearance of the region's ecosystems were likely to strengthen.

Although the SAA attempted to determine the values and attitudes of Southern Appalachian residents toward natural resources and ecosystem management, it was primarily regional information. In order to gain more specific information about people's attitudes, beliefs and lifestyles at the local level, a public survey was conducted through the Southern Research Station in conjunction with the Human Dimensions Research Lab at the University of Tennessee (Cordell et. al., 2002).

Findings of this public survey for the Sumter NF include a high value to market area residents for the protection of sources of clean water; the legacy of passing along natural forests to future generations; the protection for wildlife and habitat, healthy forests, maintenance of places that are natural in appearance, and for protection of rare or endangered species.

Outdoor recreation and timber, as values of national forests, are in the second or lower one-half of the list of values. Table 3-142 illustrates the values of local area residents more specifically.

Table 3-142. Percentage of local and regional residents 16 or older indicating the stated value is important (left of /) and percentage indicating extremely important (right of /) to emphasize in management of the listed national forest, by forest, sub-region, and region-wide in the Southern Appalachians.

Forest Value	Sumter Market Area		Southern Appalachian Region Market Area	National
Protect sources of clean water	95.3/87.9		94/86.3	94.1/82.7
Maintain for future generations	92.3/84.9		92.7/83.7	92.5/80.4
Provide protection for wildlife	89.9/74.7		88.8/72.4	88/69.4
Emphasize healthy forests	88.9/71.6		87.7/70.5	N/a
Leave them natural in appearance	88.2/70.5		85.9/68.6	85.6/64.3
Protect rare or endangered species	83.9/71.6		83.1/69.7	84.7/67.1
Provide information and educational services	79.8/56.1		80.1/55.9	79.1/52.5
Provide natural places for personnel renewal	76.4/52.8		74.1/47.8	73.4/44.8
Provide Outdoor Recreation	72.5/45.1		72.3/54.8	77.7/57.6
Provide abundant timber supply	71.2/52.0		75.8/54.2	73.9/49.1
Help local tourism businesses	52.4/30.8		57.3/36	56/31.1
Permit grazing of livestock	42.4/23.8		45.2/26.5	49.8/28
Provide raw materials and products for local industries	34.5/19.9		38.7/22.3	45.1/24.9

Source: National Survey on Recreation and the Environment, Version 12, November 2001 to April 2002. National percentages are from NSRE Version 6 and 7, September 2000 to March 2001.

Not only were the findings for the Sumter National Forest comparable to those of neighboring national forests, but they also were quite comparable to national attitudes and values regarding natural resource management (see Table 2). This is further discussed in an article published in the **Journal of Forestry (October/November 2002, pp. 31-32)**, which summarized a study done in the South.

Priorities for Management of Private Land by Non-industrial Owners

The SAA found that approximately 75 percent of the 37 million acres of the SAA region are privately owned. Of these 37 million acres approximately 19 million are forested acres. Three-fourths of the forest land in the region is privately owned.

Agriculture and timber harvesting are the overwhelming primary commodity uses of private undeveloped land. Recreation is the dominant non-commodity use. Raising livestock, recreation, enjoyment of a rural lifestyle, and having green space are most often listed as important reasons for owning land in the Southern Appalachians.

Private land dominates the South. Typically, corporate private owners provide recreation access by leasing their land to clubs, counties or others. Individual owners, however, usually open very little, if any, of their land to the public. Whether corporate or private, the number of landowners allowing public recreational access to their land has been decreasing over the years. It is expected that public access to private land will continue to decrease as more and more individuals and families purchase land for their own personal recreational pursuits. According to Cordell and Tarrant (2002),

A highly significant and growing issue nationally and in the South is that of conflict. Conflicts limit supply and increase the costs of management. Conflicts addressed in the SFRA included those between similar uses because of crowding; conflicts between non-similar uses because of incompatible norms, values and goals; and conflicts between users and providers.

Perhaps the most worrisome type of recreation conflict is that between users and owners of private tracts. These conflicts can and often do lead to posting and other ways of denying access, which act to limit supply. Because most of the forest-land in the South is privately owned, conflicts between recreational users and private forest-land owners are especially significant. Results from the 1995 National Private Landowner Survey, NPLOS 95.... suggest a number of possibilities for owner-user conflict. For example, about 59 percent of individual southern landowners indicate that improving wildlife, water, aesthetics and other natural components of their land is an important emphasis in their land management. Because landowners sometimes encounter use problems they may perceive to be incompatible with their conservation goals, land closure can result. The more prominent of such problems include dumping garbage, littering, illegal hunting and fishing, damage to fences and gates, damage to roads, disturbance of wildlife, and careless shooting.

Not all, maybe not even most, of these problems are the result of recreation use, although owners perceive them to be. As of 1995, about 41 percent of owners in the South posted their land. Among owners who already post some or all of their land, 16 percent anticipate posting more in the future. Very few anticipate posting less. Increasing demands for off-road vehicle use, hunting, fishing, and other of the more consumptive recreational activities are likely to bring about more recreation participant-land owner conflicts. In part as a response, many of the higher-income residents of the South are purchasing their own land for personal recreational pursuits. Very often these purchased lands end up being posted.

Direct, Indirect and Cumulative Effects

Social Impacts

During the forest planning process, numerous public meetings were held to allow attending interested people an opportunity to express their wants, needs and demands for access to and use of national forest resources. Many of these views were incorporated into our range of alternatives. These public meetings, however, typically represent only a portion of the public's interests and seldom represent the so-called "silent majority" who do not or cannot attend these meetings. Region 8 commissioned the Southern Research Station to undertake a telephone survey to randomly survey the public within a 75-mile radius of our national forests, which are under forest plan revision. Such a survey provides input from this broader public concerning what they would like to see emphasized in national forest management. For more information on how this survey was conducted, see the "Public Survey Report, Southern Appalachian National Forests, Sumter National Forest." Effects from our proposed land management alternatives on the public's preferences in land management follows below.

The public survey provided some information on the values residents have relating to natural resources. Well over 95 percent of the sample in the Sumter National Forest market area thought protection of clean water was an important management goal for national forests. Next highest percentages (92) were maintaining the forests in good condition for future generations, providing protection for wildlife and habitat (90), protection of trees for healthy forests (89), natural appearing forests (88), and protection of rare or endangered species (84). (See the Table 2)

The values favored least by survey participants included management of national forests to help local tourism industries, national forests as a source of grazing range for cattle, and national forests as sources of raw materials and products to support local industries and manufacturing.

People who reside in the areas near the Sumter National Forest put wildlife, ecosystems and naturalness above utilitarian objectives in the management of these national forests.

Possible management objectives of the forest were asked of respondents. The following analysis provides a comparison of the most favored management objectives versus the range of alternatives available to forest decision makers. (See the Public Survey Report, Table 5)

The continuum in the forest planning alternatives from more management activities and provision of multiple-use, to that of fewer management activities is as follows:

More Management Activities

Fewer Management Activities

F D A I E B G

Over 93 percent of local residents favored a management objective that would protect streams, lakes and watershed areas.

Alternative F, calls for water quality and riparian areas to be protected through BMP's. All the remaining alternatives call for water quality and riparian areas to be protected with the Riparian Corridor prescription. *Alternative A* would restore degraded watersheds and emphasize improvement of aquatic habitats and water quality. *Alternative I* provides resilient and stable conditions to ensure the quality and quantity of water necessary to support beneficial water uses. *Alternative B* calls for riparian ecosystems to be managed to maintain water quality. Degraded conditions would be restored. *Alternative E* provides for riparian ecosystems and streamside management zones to provide water-quality protection and improvement. *Alternative G* provides for riparian area protection and restoration through emphasis on watershed assessments. All alternatives therefore make some kind of provision for addressing clean water.

Next most favored management issues had to deal with naturalness. About 90 percent of respondents wanted the forest to be managed for wildlife by protecting their habitats; approximately 86 percent wanted management direction to protect old growth forests; approximately 82 percent want to see forests managed to provide habitat for wildlife and birds for people to see and photograph.

Alternative D would have the least emphasis of all alternatives on "naturalness" Forests would appear highly variable in tree sizes and openings and the canopy may be seen from roadways and vista points. It would provide Old Growth only on unsuitable lands already withdrawn from the timber base would be recommended for wilderness. *Alternative A* provides high quality scenery in both a natural and managed settings. Highways and roads in the forests would have forest stands with few, if any, broken views to support enhancements to tourism. Roadless areas adjacent or in close proximity to wilderness areas would be recommended for wilderness designation. *Alternative I* provides for a healthy forest by managing ecosystems through restoration or maintenance to provide for designed species composition (species mix), structure (age class distribution),

function (resulting benefits), and productivity over time. A variety of large, medium and small old growth patches will be managed (through restoration, protection, or maintenance) to meet biological and social needs. *Alternative B* would emphasize the natural processes in a natural landscape pattern. Restoration activities could produce both large and small openings. *Alternative E* supports visual quality and most areas would maintain a forested canopy. A substantial amount of the forest would be allocated to providing old growth for biological and aesthetic settings. Many insect and disease impacts would be tolerated as part of a functioning natural ecosystem. Most wild and scenic rivers would be recommended for adding to the National Wild and Scenic Rivers System. *Alternative G* would provide for roadless areas to be recommended for wilderness. Emphasis would be on establishing a naturally resilient forest that would avoid large outbreaks of forest pests. Road network mileage would be reduced through closure of roads not needed for stewardship or restoration.

The management objectives favored least by percentage indicating them to be important include: Commercial leasing of oil and gas rights (22 percent), Expand access for motorized off-highway vehicles (22 percent), allow recreational gold prospecting and dredging (23 percent), provide new paved roads for cars (30 percent), allow harvesting an mining to support local industries (34 percent).

Alternative D emphasizes a balanced age class. All lands considered suitable for sustained-yield timber management would be available for sustained-yield management. Each major forest group---pine, mixed, and hardwood---would have specific target rotation ages. *Alternative A* provides sustained yield of wood products with an emphasis on high quality sawtimber. *Alternative I* allows forest management activities where needed and appropriate to achieve the desired composition, structure, function of forest ecosystems. A result of such activities will also be to provide a sustainable supply of wood products. *Alternative B* emphasizes restoring natural resources. Wood products would be managed in concert with restoration and creating wildlife habitats. Timber sales would be a by-product of restoration management. *Alternative E* provides for the overall long-term timber product objective of large-diameter and high quality sawtimber species. *Alternative G* emphasizes large undisturbed areas. High quality timber would be produced in long rotations in areas outside sensitive species habitat.

Recreation use as a forest management objective were thought as important by about 73% of our respondents

Alternative D provides for developed and dispersed recreation opportunities in both natural and managed settings. Potential for roaded natural experiences would increase as access roads for timber harvests are built or improved. Semiprimitive experiences would be designated for unsuited lands. *Alternative A* emphasizes developed and dispersed recreation opportunities achieved by commercial recreation and increased public access. Public access would be increased in high-use areas in order to provide more recreation opportunities.

Alternative I provides a spectrum of high quality, nature-based recreation settings and opportunities which are not widely available on non-federal lands. Hiking, biking, equestrian trail systems are emphasized in non-motorized settings with high quality landscapes. OHV routes are designated in proper settings. Hunting, fishing, and non-consumptive wildlife opportunities are also emphasized. Backcountry recreation experiences are also provided. *Alternative B* provides a variety of recreating settings in areas where they would be compatible with restoration activities. A wide variety of recreation activities would be provided. *Alternative E* emphasizes settings that would attract a variety of recreation users. Active resource management would be concentrated in certain locations that support recreation use and visual quality. Dispersed and developed recreation areas and opportunities would be increased. A variety of recreation experiences including concentrated use of off-highway vehicle use is provided. *Alternative G* emphasizes backcountry and nature-oriented non-motorized recreation opportunities; semiprimitive, wildlife, and nature-oriented recreation opportunities would be provided. Developed facilities would occur where they do not detract from ecosystem function and landscape connectivity.

Economic Impacts

Economic impacts of each proposed alternative are given in the tables below. Table 3-143 illustrates how the proposed alternatives differ from the current management direction (Alternative F) by jobs. Due to substitution effects from competing non-government sources, these jobs are characterized as being **associated** with local economic activity initiated by Forest Service programs and activities, rather than **caused** by these activities.

Employment changes from the current situation range from a decrease of 29.4 percent for Alternative B to an decrease of 2.2 percent for Alternative A. Jobs vary from a low of 1,270 for Alternative B to a maximum of 1,800 under the Current direction alternative. Timber and recreation are the programs that provide the most jobs in this economy for all alternatives.

Table 3-143. Employment by Program by Alternative

Employment by Program by Alternative (Average Annual, Decade 1)							
Resource	Total Number of Jobs Contributed						
	Current	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Recreation	491	595	512	530	593	492	530
Wildlife and Fish	37	44	38	39	44	37	39
Grazing	0	0	0	0	0	0	0
Timber	939	805	446	796	556	382	649
Minerals	0	0	0	0	0	0	0
Payments to States/Counties	108	93	55	92	66	45	77
Forest Service Expenditures	225	223	220	223	221	208	222
Total Forest Management	1,800	1,759	1,270	1,680	1,479	1,164	1,517
Percent Change from Current	0.0%	-2.2%	-29.4%	-6.6%	-17.8%	-35.3%	-15.7%

Labor income by alternative is given in Table 3-144 below. The current direction alternative has \$52.6 million of labor income associated with it. The range of labor income is \$30.0 million for Alternative G to \$52.6 million for current direction. The percent changes in income from current direction range from a decrease of -5.0% for Alternative A to -41.5% for Alternative G. Timber contributes the most income to the Forest total in all alternatives.

Table 3-144. Labor Income by Program by Alternative

Labor Income by Program by Alternative (Average Annual, Decade 1; \$1,000,000)							
Resource	Millions of dollars						
	Current	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Recreation	\$10.2	\$12.3	\$10.6	\$11.0	\$12.3	\$10.2	\$11.0
Wildlife and Fish	\$0.8	\$0.9	\$0.8	\$0.8	\$0.9	\$0.8	\$0.8
Grazing	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Timber	\$30.1	\$25.8	\$14.2	\$25.5	\$17.8	\$12.2	\$20.7
Minerals	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Payments to States/Counties	\$3.5	\$3.0	\$1.8	\$3.0	\$2.2	\$1.5	\$2.5
Forest Service Expenditures	\$8.0	\$7.9	\$7.5	\$7.8	\$7.6	\$6.1	\$7.8
Total Forest Management	\$52.6	\$50.0	\$34.9	\$48.1	\$40.7	\$30.8	\$42.8
Percent Change from Current	0.0%	-5.0%	-33.7%	-8.5%	-22.5%	-41.5%	-18.6%

Employment and income found in Tables 3-143 and 3-144, respectively, are divided into the major sectors of the Sumter National Forest economy in Tables 3-145 and 3-146. For

all alternatives, Manufacturing followed by Retail Trade, Services and Government are the sectors most affected by Forest Service programs and expenditures. To the extent that an alternative has a commodity program, manufacturing is the primary sector affected to a significant degree. Labor income in the form of wages and proprietors' earnings, has a similar effect as employment on the Manufacturing sectors of this economy.

Table 3-145. Employment by Major Industry by Alternative

Employment by Major Industry by Alternative (Average Annual, Decade 1)							
Industry	Total Number of Jobs Contributed						
	Current	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Agriculture	24	25	19	23	23	18	22
Mining	0	0	0	0	0	0	0
Construction	44	40	26	39	31	22	34
Manufacturing	657	575	333	565	410	287	468
Transportation, Communication, & Utilities	40	38	26	37	31	23	32
Wholesale trade	51	51	37	48	44	34	44
Retail trade	371	409	327	375	380	307	359
Finance, Insurance, & Real Estate	40	39	27	37	32	24	33
Services	311	328	252	305	294	233	286
Government (Federal, State, & Local)	252	247	218	243	229	211	233
Miscellaneous	8	7	5	7	6	5	6
Total Forest Management	1,800	1,759	1,270	1,680	1,479	1,164	1,517
Percent Change from Current	0.0%	-2.2%	-29.4%	-6.6%	-17.8%	-35.3%	-15.7%

The magnitude of payments to counties expected in the first decade is shown in Table 3-147 below. Payments to the counties within the Sumter National Forest boundaries would range from \$4.8 million for the current alternative to \$2.0 million under Alternative G. It is important to note that these estimates are based primarily on the potential timber harvest and recreation use assumed for each alternative. Actual payments to the counties are based on recent legislation contained in the Secure Rural Schools and Community Self-Determination Act of 2000 (PL106-393). All the counties in this impact area selected the full payment option which allows each county to receive their share of the average of the three highest 25 percent payments during the period from 1986 through 1999.

Table 3-147. Forest Service Revenues and Payments to Counties

Forest Service Revenues and Payments to Counties (Annual Avg, Decade 1; \$1,000,000)							
Forest Service Program	Current	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G	Alt. I
Recreation	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
Wildlife and Fish	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Grazing	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Timber	\$19.3	\$16.5	\$9.7	\$16.4	\$11.6	\$8.0	\$13.6
Minerals	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Soil, Water & Air	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Protection	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Total Revenues	\$19.4	\$16.6	\$9.8	\$16.5	\$11.7	\$8.1	\$13.7
Payment to States/Counties	\$4.8	\$4.1	\$2.4	\$4.1	\$2.9	\$2.0	\$3.4

Cumulative effects analysis is designed to reveal the context of alternative impacts within the planning area and over time. This is done by comparing total changes in the planning area *with* each alternative to total changes *with* no action. Such a comparison is done by estimating employment and income at the expected end of the forest planning horizon (15 years) and calculating the share of the total economy that each alternative represents of the entire economy. Estimates for employment and income growth were derived by calculating the average annual increase in employment and the real average annual income growth for counties in the analysis area from 1969 to 2000 using U.S Bureau of Economic Analysis county-level data (www.bea.doc.gov).

The analysis assumes that the underlying economic relationships are held constant at the 2000 levels. Forest Service data related to Forest Service programs are for the fifteen year planning horizon. Also, the assumption made in our analysis is that the same rate of growth experienced during the 1969 to 2000 time period will continue over the 15 years of the forest plan.

Table 3-148 displays the cumulative effects results using employment and labor income for the planning area. The first two columns present the 2000 base year data for the planning area and the portion of the base year attributable to use and management of the national forest. The next column shows projections made for 2015. Included in the projections are employment and income effects attributed to the current direction (or no action) alternative. The remaining columns of the table show the cumulative effects for each alternative over the planning horizon, which ends in 2015. Forest program outputs for each alternative are for the 15-year planning horizon. .

In 2000 management of the national forest accounted for 1.1 percent of all **employment** under the no action alternative, and 1.0 percent in 2015 for the no action alternative. For the proposed alternatives in the EIS, expected shares of the economy will range from 0.6

percent of the economy for alternative G to 1.0 percent for alternative A. The preferred alternative I shows a 0.8 percent share of the local economy in 2015.

Employment changes in 2015 from the no action alternative range from -2.2 percent for alternative A to -35.3 percent for alternative E. The preferred alternative I shows a -15.7 percent change.

In 2000 management of the national forest accounted for 1.3 percent of all labor **income** under the no action alternative, and 0.9 percent in 2015 for the no action alternative. For the proposed alternatives in the EIS, expected shares of the economy will range from 0.5 percent of the economy for alternative G to 0.9 percent for alternatives A and D. The preferred alternative I shows a 0.8 percent share of the local economy in 2015.

Income changes in 2015 from the no action alternative range from -5.0 percent for alternative A to -41.5 percent for alternative G. The preferred alternative I shows a -18.6 percent change.

The cumulative effects analysis shows that over time employment and income proportionate share of the economy that is attributable to national forest program management will decline for all alternatives. The no-action alternative (current direction) would be the largest contributor to the economy.

Table 3-148 Cumulative Economic Impacts in 2015

Economic Indicator	2000		2015						
	Area Totals	Forest Portion	Area Totals	Forest Portion					
				Alt.F-NA	Alt. A	Alt. B	Alt. D	Alt. E	Alt. G
Employment									
Total (jobs)	158,784	1,800	180,816	1,800	1,759	1,270	1,680	1,479	1,164
% of Area Totals	100%	1.1%	100%	1.0%	1.0%	0.7%	0.9%	0.8%	0.6%
% Change from No Action	---	---	---	0.0%	-2.2%	-29.4%	-6.6%	-17.8%	-35.3%
Labor Income									
Total (\$ million)	\$4,179.0	\$52.6	\$5,652.0	\$52.6	\$50.0	\$34.9	\$48.1	\$40.7	\$30.8
% of Base	100%	1.3%	100%	0.9%	0.9%	0.6%	0.9%	0.7%	0.5%
% Change from No Action	---	---	---	0.0%	-5.0%	-33.7%	-8.5%	-22.5%	-41.5%

Economic Indicator	2000		2015						
	Area Totals	Forest Portion	Area Totals	Forest Portion					
				Alt. I	--	--	--	--	--
Employment									
Total (jobs)	158,784	1,800	180,816	1,517	0	0	0	0	0
% of Area Totals	100%	1.1%	100%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change from No Action	---	---	---	-15.7%	-100.0%	-100.0%	-100.0%	-100.0%	-100.0%
Labor Income									
Total (\$ million)	\$4,179.0	\$52.6	\$5,652.0	\$42.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
% of Area Totals	100%	1.3%	100%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change from No Action	---	---	---	-18.6%	-100.0%	-100.0%	-100.0%	-100.0%	-100.0%

Finally, Table 3-149 below illustrates the percentage contribution of the Sumter National Forest's current management program (Alternative F) to the area's economy. The Sumter National Forest is associated with 1 percent of the total local economy's jobs, and

0.9 percent of the labor income. Manufacturing, Retail Trade, Services, and Government are the sectors of the economy that show the most benefit from the forest's activities.

Table 3-149. Current Role of Forest Service-Related Contributions to the Area Economy

Current Role of Forest Service-Related Contributions to the Area Economy				
Industry	Employment (jobs)		Labor Income (\$ million)	
	Area Totals	FS-Related	Area Totals	FS-Related
Agriculture	8,534	24	\$103.6	\$0.3
Mining	59	0	\$1.9	\$0.0
Construction	12,136	44	\$378.4	\$1.6
Manufacturing	58,073	657	\$2,030.7	\$23.6
Transportation, Communication, & Utilities	5,773	40	\$303.6	\$1.7
Wholesale trade	4,757	51	\$142.5	\$1.7
Retail trade	28,721	371	\$457.7	\$6.0
Finance, Insurance, & Real Estate	5,645	40	\$131.7	\$1.0
Services	30,959	311	\$676.9	\$6.9
Government (Federal, State, & Local)	29,230	252	\$836.8	\$9.7
Miscellaneous	1,365	8	\$9.7	\$0.1
Total	185,252	1,800	\$5,073.5	\$52.6
Percent of Total	100.0%	1.0%	100.0%	1.0%

Present Net Value of the Alternatives

Table 3-150 shows estimated benefits, costs, net benefits, and cumulative present net value (PNV) by alternative. All figures are in 2000 dollars. The benefits in Table 3-149 include market values and non-market estimated values. Market values include those values where the Forest Service receives money such as for timber, range, special uses, etc. Non-market values are estimated values for amenities such as wildlife and recreation.

Table 3-150. Cumulative Decadal Present Values of Costs and Benefits

Cumulative Decadal Present Values of Costs and Benefits in Millions of \$2000									
	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I		
Cummulative Total									
Present Net Value	\$1,280,515	\$1,053,140	\$1,163,470	\$1,219,837	\$1,131,277	\$998,427	\$1,135,597		
Present Value benefits by Program:									
Range:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Timber:	\$300,567	\$207,489	\$299,007	\$233,169	\$337,416	\$150,507	\$268,521		
Minerals:	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Recreation	\$411,913	\$359,751	\$369,456	\$409,445	\$345,933	\$344,220	\$369,456		
Wildlife:	\$789,059	\$694,209	\$714,593	\$789,059	\$673,826	\$673,826	\$714,593		
PV of Benefits	\$1,501,538	\$1,261,449	\$1,383,056	\$1,431,673	\$1,357,176	\$1,168,554	\$1,352,571		
Present Value costs by Program:									
Range:	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Timber:	\$47,696	\$37,356	\$48,850	\$39,664	\$57,471	\$25,296	\$44,823		
Roads/Engineering	\$31,348	\$26,646	\$31,348	\$26,646	\$31,348	\$23,511	\$31,348		
Minerals:	\$2,503	\$2,503	\$2,503	\$2,503	\$2,503	\$2,503	\$2,503		
Recreation	\$24,207	\$20,811	\$21,617	\$24,207	\$20,006	\$20,006	\$21,617		
Wildlife:	\$21,225	\$25,470	\$21,225	\$25,470	\$21,225	\$16,980	\$23,337		
Soil, Water, Air..	\$16,936	\$18,417	\$16,936	\$16,240	\$16,240	\$15,434	\$16,240		
Protection/Forest									
Health	\$53,552	\$53,552	\$53,552	\$53,552	\$53,552	\$42,842	\$53,552		
Lands	\$5,312	\$5,312	\$5,312	\$5,312	\$5,312	\$5,312	\$5,312		
Planning, Inv.,									
Monitoring	\$18,243	\$18,243	\$18,243	\$18,243	\$18,243	\$18,243	\$18,243		
PV Costs	\$221,023	\$208,310	\$219,586	\$211,836	\$225,899	\$170,126	\$216,974		

Alternative F (Current Management): This alternative provides more PNV than Alternatives B and G but less than Alternatives A, E, D, and I. It ranks fifth in terms of total PV benefits and highest in regards to PV costs. Overall this alternative ranks fifth in terms of total PNV.

Alternative A: This alternative has the highest PNV. With its emphasis on the production of goods and services beneficial to local economies and communities and the concomitant higher timber, recreation and wildlife benefits, this alternative provides the highest total PV benefits..

Alternative B: With an emphasis on natural resources and creating and maintaining wildlife habitats, this alternative has the highest wildlife costs of all alternatives with the exception of Alternative E, which has the same amount of wildlife costs. Overall, this alternative ranks sixth in terms of Total PNV.

Alternative D: This alternative provides the third highest Total PNV. While in terms of total benefits this alternative ranks third, it has the second highest total costs. This high cost is primarily due to this alternative's emphasis on increased timber production.

Alternative E: This alternative with its emphasis on a variety of recreation uses provides the second highest Total PNV. This alternative along with Alternative A has the highest wildlife benefits of all the alternatives and ranks second in recreation benefits.

Alternative G: This alternative has the lowest PNV because it has the lowest PV benefits. This is primarily the result of having the lowest timber, recreation, and wildlife benefits of all the alternatives with the exception of Alternative F, which has the same wildlife benefits.

Alternative I: This alternative provides more Total PNV than Alternatives F, B, and G but less than Alternatives A, E and D. In regards to PV benefits it ranks fourth and in regards to costs it ranks third. Overall this alternative ranks fourth in terms of total PNV.

UNAVOIDABLE ADVERSE EFFECTS

Implementation of any alternative would result in some adverse environmental effects that cannot be avoided. The application of the management prescriptions, standards, best management practices (BMP's), and monitoring and evaluation are intended to limit the extent, severity, and duration of these effects. Although the formulation of the alternatives included avoidance of potential adverse environmental effects, some adverse impacts to the environment that cannot be completely mitigated are expected to occur.

Some adverse effects are of a transitory type. For example, air quality could be diminished on a recurring, though temporary, basis due to the use of prescribed fire used to restore plant communities or enhance wildlife habitat. Even though standards require prescribed burning to be scheduled for times when weather conditions would provide for smoke dispersion, the presence of smoke and haze over or adjacent to the Forest would detract from people's expectation of clean air. Recreation traffic, timber hauling, and the operation of other internal combustion engines, could have localized and temporary adverse effects on air quality where these activities occur.

The natural landscape would appear altered by management activities, particularly where activity is highly visible from travel routes. Prescribed burning in forest communities and their blackened appearance would also be apparent. These temporary adverse effects would eventually be reduced by regrowth of vegetation and weathering. Other impacts on the natural appearance of the landscape include roads and certain recreational structures that are highly visible despite efforts to blend them with landforms and mitigate the effect by landscaping.

Disturbance, displacement, or loss of fish and wildlife may occur as a consequence of habitat loss and increased human recreational activity in areas. Roads and their associated use can impact fish and wildlife due to human activities associated with new access. Improved access into areas that previously had low-standard roads would have similar effects. Other wildlife use could increase by increased management.

Both the amount and distribution of mature stands would be changed through implementation of any alternative. The rate and severity of adverse impacts varies by alternative. Some wildlife species rely on habitat conditions provided by late successional habitats, a reduction or shift in the populations (range) of some wildlife species can be expected.

Although standards, BMPS, and monitoring plans are designed to prevent significant impacts to soil and water, the potential for impacts does exist. Sediment production could exceed natural rates in locations as long as roads are being built or maintained, management activities that include harvesting and removal of timber, dispersed and developed recreation continues along riparian corridors, and forest

communities/habitats are restored. Sediment would result from surface erosion, channel erosion, and mass movement.

Fire hazard and resistance to control would increase subsequently to designating more areas to either wilderness or allocations that would not be favorable to management activities, this would result in increased accumulation of forest residues. The potential for these adverse impacts increases relative to the lack of emphasis on management activities in the alternatives being considered. Wildfire risk would increase where access results in more people being drawn into an area. Some risk would be mitigated by early detection, suppression, and prevention methods. Long-term increases in fuel hazard would be mitigated through fuels management activities that are responsive to forest health management objectives.

RELATIONSHIP OF SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

The relationship between the short-term uses of man's environment and the maintenance and enhancement of long-term productivity is complex.

Short-term uses are those that generally occur annually on parts of the Forest, such as prescribed burning and dispersed recreational camping.

Long-term refers to longer than a 10-year period, and productivity is the capability of the land to provide market and amenity outputs and values for future generations. Soil and water are the primary factors of productivity and represent the relationship between short-term uses and long-term productivity. The quality of life for future generations would be determined by the capability of the land to maintain its productivity. By law, the Forest Service must ensure that land allocations and permitted activities do not significantly impair the long-term productivity of the land.

The alternatives considered in detail, including the preferred alternative, incorporate the concept of sustained yield of resource outputs while maintaining the productivity of all resources. The specific direction and mitigation measures included in the Forestwide management standards ensure that long-term productivity would not be impaired by the application of short-term management practices.

Each alternative Forest Plan was analyzed using the Spectrum linear programming model (See Appendix B – Description of the Analysis Process), to ensure that the minimum standards could be met. The alternative was changed if some aspect did not meet any of the minimum standards. Through this analysis, long-term productivity of the Forest's ecosystems is assured for all alternatives.

Alternatives F, and D have the highest level of short-term uses, as reflected by the acres of vegetation treatment, and they therefore result in higher levels of short-term consequences such as visual impact, fire hazard, and increased sedimentation. In a decreasing order of short-term uses, Alternative A followed by Alternatives I, E, and B. Alternative G has the lowest level of short-term uses and therefore the lowest level of short-term consequences.

As stated earlier, the effects of short-term or long-term uses are extremely complex, and depend on management objectives and the resources that are emphasized. No alternative would be detrimental to the long-range productivity of the Sumter National Forest.

The management prescriptions and the effects of implementing the revised Forest Plan would be monitored to provide data that ensures satisfying standards for long-term productivity. Monitoring requirements and standards would apply to all alternatives, and are included in Chapter 5 of the revised Forest Plan.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources results from a decision to use or modify resources that is renewable only over a long period of time, such as soil productivity; or nonrenewable resources, such as cultural resources or minerals. The revised Forest Plan and the alternatives examined were all based on the principles of multiple use and long-term productivity for all resources. Measures to protect natural resources that could be irreversibly affected by management activities were incorporated into Forestwide standards.

Irretrievable commitment of resources is the production of renewable resources lost due to allocation decisions that forgoes the production or use of renewable resources. Allocation decisions that do not allow for the production or use of most renewable resources for relatively long periods of time include those that establish wilderness, roadless, scenic areas, wild and scenic rivers, recreation sites, and the construction of new roads. The total number of acres committed to these uses remains essentially the same for all alternatives, although the types of allocated uses vary. By contrast, non-wilderness allocation for areas is considered an irretrievable loss of increased wilderness opportunities. Tradeoffs between wilderness, roadless, and other uses are discussed previously in Chapter 3.

Under a given alternative, differences between output levels and the higher levels that otherwise could be produced also represent irretrievable commitment of resources. For example, a low level of forage use for livestock grazing or a low level of timber yield could be increased in the future, based on different management prescriptions, but the outputs between now and then would be “lost ” or not available for use. The production thus lost would be irretrievable, but the action is not irreversible.

Archeological resources are part of an absolutely nonrenewable and irreplaceable resource base. Once disturbed, for whatever reason, the impacted portion of a property cannot be replaced or repaired, even though controlled data recording techniques may recover part of the information contained in the damaged site.

Archeological surveys and evaluations routinely use small shovel tests or larger) excavations to address research designs or potential. These excavations represent the controlled destruction of a portion of an archeological site. The results of such excavations are an irreversible effect. This is balanced by using conventional, accepted archeological techniques and methods with a commitment to high standards.

Any other resource management action or result, whether planned or inadvertent, that diminishes the character or integrity of a heritage property, has irreversibly committed a portion of that site 's value.

UNAVAILABLE OR INCOMPLETE INFORMATION

The Sumter National Forest has used the most current scientific information available and state-of-the-art analytical tools to evaluate management activities and to estimate their environmental effects.

However, gaps exist in our knowledge. The Council on Environmental Quality regulations discuss the process for evaluating incomplete and unavailable information (*40 CFR 1502.22 (a) and (b)*). Incomplete or unavailable information is noted in Appendix G of the Forest Plan.

Forest Plan monitoring is designed to evaluate assumptions and predicted effects. Should new information become available, the need to change management direction or amend the Forest Plan would be determined through the monitoring and evaluation process.

ENVIRONMENTAL JUSTICE

A specific consideration of equity and fairness in resource decision-making is encompassed with the concerns of environmental justice. As required by Executive Order 12898, all federal actions must consider potentially disproportionate effects on minority or low-income communities. Principles for considering environmental justice are outlined in Environmental Justice Guidance under the National Environmental Policy Act (Council on Environmental Quality 1997). Those principles were considered in this analysis.

The Social and Economic Environment section identified the demographics of minorities and low-income populations. The 11 county impact area basically reflects the same percentages of minorities and low-income populations as the state of South Carolina. Based on the disclosure of effects in Chapter 3 and the programmatic nature of these decisions, it can be concluded there are no disproportionately adverse environmental or health effects to low-income or minority populations. Public involvement during this plan revision was inclusive of all publics including minorities and low-income populations.

CHAPTER 4

LIST OF PREPARERS

A listing of the major preparers (interdisciplinary team) of the Draft Environmental Impact Statement for the Sumter National Forest and the revised Forest Plan follows. Experience and educational background have been included for these team members. The Forest Management Team and other contributors are also listed.

THE INTERDISCIPLINARY TEAM

John Cleeves – Team Leader

Education BS in Forest Management, MS in Environmental
Planning/Operations Research, Colorado State University.
Experience 26 years of experience on 7 National Forests in 3 Regions.

Gary Peters – Wildlife Biologist

Education BS in Public Policy with a concentration in Environmental
Science, Indiana University; AAS in Recreation and Wildlife
Management, Hocking Technical College.
Experience 24 years with the US Forest Service on a variety of National
Forests, serving in NEPA, Wildlife, and many different fields.

Robin Roecker – Forest Botanist/Ecologist

Education BS in Biology, Berry College; MS in Forest Resources, University
of Georgia.
Experience 4 years in research and teaching; 12 years with the US Forest
Service

Robbin Cooper – Landscape Architect/Recreation Planner

Education: BLA, Louisiana State University

Experience: 12 years, Francis Marion & Sumter National Forests

Jay Purnell – Forest Silviculturist

Education BS in Forest Management, Auburn University

Experience 24 years of experience on 3 National Forests in 2 Regions.

Bill Hansen – Forest Hydrologist

Education B.S. and M.S. degree in forestry from the University of Missouri, with an emphasis on hydrology.

Experience 28 years as a hydrologist for the USDA Forest Service, spending 8 years on the Siskiyou National Forest in Grants Pass, Oregon and 20 years on the Francis Marion National Forest in Columbia, South Carolina, with about 6 years of that time being shared with the Chattahoochee-Oconee National Forests in Gainesville, Georgia.

Eric Schmeckpeper – GIS Specialist/Analyst

Education B.S. in Forestry, University of Florida
M.S. in Forestry (Silviculture), N.C. State University
Graduate work towards MS in Geography, Murray State University, Kentucky

Experience 12 years experience with TVA at Land Between The Lakes National Recreation Area
5-1/2 years experience with USDA Forest Service on FMS in SC

Gail White – Public Affairs Specialist

Education BA in English, University of South Carolina

Experience 18 years experience with the US Forest Service

FORMER INTERDISCIPLINARY TEAM MEMBERS

Barry Lilly – Silviculturist
Marty Kindred – Silviculturist
Deryl Jevons – Public Affairs Specialist
Lauren Kindred – Wild and Scenic River Specialist

THE MANAGEMENT TEAM

Jerome Thomas – Forest Supervisor
Elizabeth LeMaster – District Ranger, Long Cane District
Mike Crane – District Ranger, Andrew Pickens District
Dick Rosemier – District Ranger, Enoree District
Orlando Sutton – District Ranger, Francis Marion
J. LaRue Bryant – Union President, Local # FL379
Stephen Wells – Fire, Lands and Minerals Staff Officer
Stephanie Neal-Johnson – Public Affairs Staff Officer
JaSal Morris – Administrative Staff Officer
Oscar Stewart – Wildlife, Timber, Fish, Water, Soils, Air and Rare Plants Staff Officer
Tony White – Planning, Recreation, Engineering, GIS and Heritage Staff Officer

FORMER MANAGEMENT TEAM MEMBERS

Angela Coleman – Public Affairs Staff Officer
David Carter – District Ranger, Long Cane District
Skip Starkey - Planning, Recreation, Engineering, GIS and Heritage Staff Officer
David Wilson – Forest Supervisor
Jerry Henderson - Wildlife, Timber, Fish, Water, Soils, Air and Rare Plants Staff Officer
Ron Smith – District Ranger, Enoree District
Beth Merz – District Ranger, Andrew Pickens
Ivan Cupp - Fire, Lands and Minerals Staff Officer
Don Kinnerson – District Ranger, Francis Marion

OTHER MAJOR CONTRIBUTORS

Ed Hedgecock – Forest Engineer
Bill Jackson – Air Quality Specialist
Robert Morgan – Archeologist
Jeanne Riley – Fisheries Biologist
Dennis Law – Soil Scientist
Laura Barrett – Fire

Charlie Kerr – Fire
Joe Robles – Recreation Program Manager
Paul Arndt – Regional Planner
Tim Mersmann – Regional Biologist
Clair Redmond – Regional Economist
Robert Wilhelm – Regional Planner

CHAPTER 5

FEIS DISTRIBUTION LIST

The *Final Environmental Impact Statement* for the Revised Forest Plan was distributed to agencies, organizations, and individuals as required by National Environmental Policy Act regulations (40 CFR 1502.19) and Forest Service Environmental Policies and Procedures Handbook (FSH 1909.15, 63.1-64). Further, organizations and individuals on the forest planning mailing list and those who commented on the DEIS were notified of the availability of both the plan and the FEIS in hard copy, on CD-ROM, and on the forest's website. Respondents received the documents in the format they requested.

This list is not intended to be complete; the complete mailing list is on file at the Forest Supervisor's Office, 4931 Broad River Road, Columbia, SC, 29212-3530, (803) 561-4000.

FEDERAL AGENCIES

Agriculture, U.S. Department of
Forest Service
Washington Office

Regional Offices

Region 1 – Missoula, Montana
Region 2 – Lakewood, Colorado
Region 3 – Albuquerque, New Mexico
Region 4 – Ogden, Utah
Region 5 – San Francisco, California
Region 6 – Portland, Oregon
Region 8 – Atlanta, Georgia
Region 9 – Milwaukee, Wisconsin
Region 10 – Juneau, Alaska

National Forests Supervisor's and Forest Manager's Offices

National Forests in Alabama
National Forests in Florida
National Forests in Mississippi
National Forests in North Carolina
National Forests in Texas
Caribbean (Puerto Rico)
Chattahoochee and Oconee (Georgia)
Cherokee (Tennessee)
Daniel Boone (Kentucky)
Kisatchie (Louisiana)
George Washington and Jefferson (Virginia)
Ouachita (Oklahoma and Arkansas)
Ozark-St. Francis (Arkansas)
Savannah River Forest Station (South Carolina)

District Offices of the Francis Marion and Sumter National Forests

Andrew Pickens
Enoree (both offices)
Long Cane
Wambaw/Witherbee

Forest and Ranger Experiment Stations

Southern Research Station

Natural Resource Conservation Service

Army Corps of Engineers

Environmental Protection Agency
Office of Environmental Affairs

Federal Congressional Delegation

Senator Ernest F. Hollings
Senator Lindsey Graham
Congressman Gresham Barrett
Congressman Jim DeMint
Congressman John M. Spratt Jr.

Federal Energy Regulatory Commission

Interior, U.S. Department of
Bureau of Land Management
Fish and Wildlife Service
Geological Survey

STATE AGENCIES

Clemson Extension Service
Clemson University
Department of Archives and History
Forestry Commission
Department of Health and Environmental Control
Highway Department
Governor's Office
Parks, Recreation, and Tourism
Water Resources Commission
Department of Natural Resources

Western Carolina University

Georgia Wildlife Resources Department

STATE ELECTED OFFICIALS

Senator Thomas C. Alexander

County/ City Officials and Agencies

Abbeville County Administrator
Abbeville County Development Board
Laurens County Administrator
Newberry County Council

LIBRARIES

Abbeville County Library (Abbeville)
Aiken-Bamberg-Barnwell-Edgefield Regional Library (Aiken)
Chester County Library (Chester)
Edgefield County Public Library (Edgefield)
Fairfield County Library (Winnsboro)
Abbeville-Greenwood Regional Library (Greenwood)

Laurens County Library (Laurens)
McCormick County Library (McCormick)
Newberry County Library (Newberry and Whitmire branch)
Oconee County Library (Walhalla and Salem, Seneca, and Westminster branches)
Richland County Public Library (Columbia)
Saluda County Library (Saluda)
Union County Library (Union)

BUSINESSES AND ORGANIZATIONS

Alexandria Forestry Center
American Whitewater Association
Benefit Controls Companies
Black America Outdoors
Bowater Inc.
Canal Wood
Carolina Canoe Club
Catawba Regional Planning Commission
Chattooga Outpost
Chattooga River Watershed Coalition
Chattooga Whitewater Shop
Columbia Enduro Riders Association
Discover Upcountry Carolina Association
Foothills Paddling Club
Foothills Trail Conference
Forest Conservation Council
Forest Green Ltd.
Gun Shop
International Paper
John de LaHowe School
Keep America Free
Kiser Lumber Company, Inc.
McCormick Soil and Water Conservation District
National Forest Products Association
National Wildlife Federation
National Wild Turkey Federation
Naturaland Trust
Nature Conservancy
Newberry College
Newberry Opera House Foundation, Inc.
Norbord South Carolina Inc.
Pollard Lumber Company
Professional Paddlesports Association
Quail Unlimited Inc.
Resource Management Service

Ruffed Grouse Society
Sierra Club, South Carolina Chapter
Society of American Foresters
South Carolina Bow hunters Association
South Carolina Forest Watch
South Carolina Forestry Association
South Carolina Nature Conservancy
South Carolina Off-Road Enthusiasts
South Carolina Sportsmen's Coalition
South Carolina Timber Purchaser's Association
South Carolina Trout Unlimited
South Carolina Wildlife Federation
Southern Timber Purchasers Council
Southern Appalachian Biodiversity Project
Southern Appalachian Forest Coalition
Teachy Mechanical Inc.
Union Conservation District
Wall Grading
Westvaco Corporation
Wilderness Society, Southeastern Region

INDIVIDUALS

Copies of the FEIS were mailed to individuals that were on the forest's mailing list or who commented on the Draft Environmental Impact Statement (DEIS) and requested a copy. The mailing list and those who commented on the DEIS is on file in the Francis Marion and Sumter National Forests Supervisor's Office, 4931 Broad River Road, Columbia, SC, 29212-3530, (803) 561-4000.

CHAPTER 6

GLOSSARY

Acronyms

AA - analysis area	CVHW - cove hardwood.
ACP - Agriculture Conservation Program	CWA - Clean Water Act
AD - Administratively Determined	CWS - coarse woody debris
ADA - Americans with Disabilities Act	
AMS - Analysis of the Management Situation	DBH - diameter at breast height
APHIS - Animal and Plant Health Inspection Service	DBRU - Drainage Basin Response Unit
ASQ - allowable sale quantity	DEIS - Draft Environmental Impact Statement
AT - Appalachian Trail	DFC - desired future condition
ATV - all-terrain vehicle	
AUM - animal unit month	EA - Environmental Assessment
	ECOMAP - Ecological Classification and Mapping Task Team
BA - basal area	ECS - Ecological Classification System
BF - board foot	EIS - Environmental Impact Statement
BMP - best management practice	EMU - ecological management unit
BIO - biological oxygen demand	EPA - Environmental Protection Agency
BSS - base sale schedule	ESA - Endangered Species Act
	EWPP- Emergency Watershed Protection Plan
CAA - Clean Air Act	
CCF - hundred cubic feet	FDR - forest development road
CEQ - Council on Environmental Quality	FRP - Forest Road Program
CF - cubic foot	FEIS - Final Environmental Impact Statement
CFL - commercial forest land	FH - Forest Highway
CFR - Code of Federal Regulations	FIA - Forest Inventory and Analysis
CFS - cubic feet per second	FMAP - Fire Management Action Plan
CIP - Capital Investment Program	FR - Forest Road
CISC - Continuous Inventory of Stand Conditions	FSH - Forest Service Handbook
CISE - Continuous Inventory of Strand Condition	FSM - Forest Service Manual
CMAI - culmination of mean annual increment	FTE - full-time employee
CompPATS - Computerized Project Analysis of Timber Sales	FY - fiscal year
	GAO - Government Accounting Office

GFA – General Forest Area
 GIS - Geographic Information System
 GPD - gross domestic product

 HRP - Human Resource Program
 HUC – Hydrologic Units

 IDT - Interdisciplinary Team
 IPM - integrated pest management
 IS - Interpretive Services

 LAR - Land Area Report
 LE - law enforcement
 LOAS – Land Ownership Adjustment Strategy
 LTA - landtype association
 LTP - landtype phase
 LTSYC - long-term sustained-yield capacity
 LUG - land-use group
 L&WCF - Land and Water Conservation Fund

 LWD – large woody debris

 M - thousand
 M\$ - thousands of dollars
 MA - management area
 MAR - Management Attainment Report
 MAUM - thousand animal unit month
 MBF - thousand board feet
 MCF - thousand cubic feet
 MIL - management intensity level
 MIS - management indicator species
 MM - million
 MM\$ - millions of dollars
 MMBF - million board feet
 MMCF - million cubic feet
 MMR - minimum management requirement
 MMRVD - million recreation visitor-day
 MOU - memorandum of understanding
 MRVD - thousand recreation visitor-day
 MWFUD - thousand wildlife and fish user-day

 NAAQS - National Ambient Air Quality Standards

NAPAP – National Acid Precipitation Assessment Program
 NEPA - National Environmental Policy Act
 NF - National Forest
 NFMA - National Forest Management Act
 NFRS – National Forest Recreation Survey
 NFS – National Forest System
 NFSR – National Forest System Road
 NIPF – Non-industrial Private Landowner
 NLFCA – National Listing of Fish Consumption Advisories
 NOAA – National Oceanic and Atmospheric Agency
 NPL – National Priorities List
 NPS – National Parks Service
 NRCS - Natural Resources Conservation Service
 NRI – Natural Resource Inventory
 NSO – no surface occupancy
 NTMB - neotropical migratory birds
 NVUM – National Visitor Use Monitoring
 NWPS - National Wilderness Preservation System

 OHV - off-highway vehicle
 OMP - operation maintenance and protection
 ORV - off-road vehicle

 PAOT - persons-at-one-time
 PETS - proposed, endangered, threatened, or sensitive
 PNWR - Piedmont National Wildlife Refuge
 PL - public law
 PM - particulate matter
 PNV - present net value
 PNW - present net worth
 PRODCL - productivity class
 PSD - prevention of significant deterioration
 PSI - pounds per square inch

 RAP – Roads Analysis Process or Procedure
 RARE - Roadless Area Review and Evaluation

RARE II - the second Roadless Area Review and Evaluation	VIS - Visitor Information Services
RBP – Rapid Bioassessment Protocol	VMS – Visual Management System
RCW - red-cockaded woodpecker	VQO - visual quality objective
RCW EIS - Final Environmental Impact Statement for the management of the Red-cockaded Woodpecker and its habitat on National Forests in the Southern Region	WFUD - wildlife and fish user-day
RD - Ranger District	WHI - wildlife habitat improvement
RIM - Recreation Information Management	WIN - Watershed Improvement Inventory
RMO – Road Management Objectives	WO - Washington Office
RNA - research natural area	WPIN - white pine
RNAT - roaded natural	WRD - Wildlife Resources Division
ROD - record of decision	WRP – Wetlands Reserve Program
ROS - Recreation Opportunity Spectrum	WSA - wilderness study area
ROW - right-of-way	WURR – Water Use Rights and Requirements
RPA - Resources Planning Act	
RVD - recreation visitor-day	YPIN - yellow pine
SAA - Southern Appalachian Assessment	
SCORP - State Comprehensive Outdoor Recreation Plan	
S&G - standard and guideline	
SH - state highway	
SIO – Scenic Integrity Objective	
SIP - State Implementation Plan	
SMS – Scenery Management System	
SPB - southern pine beetle	
SPMO - semiprimitive motorized	
SPNM - semiprimitive non-motorized	
SMZ – Streamside Management Zone	
T&E - threatened and endangered	
TNC - The Nature Conservancy	
TSI - timber stand improvement	
TSPIRS - Timber Sale Program Information Reporting System	
TVA - Tennessee Valley Authority	
UPLD - upland hardwood/mixed	
USC - United States Code	
USDA - U.S. Department of Agriculture	
USDI - U.S. Department of Interior	
USFWS - U.S. Fish and Wildlife Service	
USGS - U.S. Geological Survey	

Definitions

Definitions were taken from the following sources:

Code of Federal Regulations (CFR) Title 36, *Parks, Forests, and Public Property*, Chapter II, Forest Service, Department of Agriculture; Part 219, Planning, Section A—National Forest System Land and Resource Management Planning; Section 219.3, Definitions and Terminology, Revised July 1, 1998. (Referred to as 36 CFR 219.3)

Forest IDT is the Interdisciplinary Team on the Chattahoochee-Oconee NFs. (Referred to as Forest IDT)

Society of American Foresters. 1998. *The Dictionary of Forestry*. Edited by John A. Helms. 210 p. (Referred to as SAF)

Timber Staff is the Timber Staff on the Chattahoochee-Oconee NFs. (Referred to as Timber Staff)

USDA Forest Service, *Final Environmental Impact Statement for the Chattahoochee-Oconee National Forests Land and Resource Management Plan*, Southern Region, Supervisor's Office, Gainesville, GA, 1985. (Referred to as FEIS)

Forest Service Handbook (FSH) 2090.11, *Ecological Classification and Inventory Handbook*, WO Amendment 2090.11-91-1, Effective 4/26/91, 05 - Definitions. (Referred to as FSH 2090.11-05)

FSH 2409.13, *Timber Resource Planning Handbook*, WO Amendment 2409.13-92-1, Effective 8/3/92, 05 - Definitions. (Referred to as FSH 2409.13-05)

FSH 2409.15, *Timber Sale Administration Handbook*, Amendment No. 2409.15-96-2, Effective Sept. 19, 1996, 05 - Definitions. (Referred to as FSH 2409.15-05)

FSH 2409.17, *Silvicultural Practices Handbook*, 1/85 WO, Chapter 9 - Timber Stocking Guides and Growth Predictions, 9.05 - Definitions. (Referred to as FSH 2409.17-9.05)

FSH 2609.13, *Wildlife and Fisheries Program Management Handbook*, WO Amendment 2609.13-92-1, Effective 8/3/92, Chapter 70 - Analysis of Economic Efficiency of Wildlife and Fisheries Projects, 70.5 - Definitions. (Referred to as FSH 2609.70.5)

FSH 2709.12, *Road Rights-of-Way Grants Handbook*, 9/85 WO, Zero Code, 05 - Definitions. (Referred to as FSH 2709.12-05)

Forest Service Manual (FSM) 1900 - Planning, Amendment No. 1900-91-3, Effective March 15, 1991, 1905 - Definitions. (FSM 1905)

FSM 2060, Tuxen 1956 as cited in Mueller-Dombois and Ellenberg 1974, USDA Forest Service Ecosystem Management Coordination, Resource Information Group, <<http://www.fs.fed.us/emc/rig/includes/section1.pdf>>

FSM 2163, *Hazardous Waste Management*, Chapter 2163.05, Definitions.
(Referred to as FSM 2163)

FSM 2200, *Range Management*, WO Amendment 2200-91-1 Effective 3/1/91,
Chapter 2230, Grazing and Livestock Use Permit System, 2230.5 - Definitions.
(Referred to as FSM 2230)

FSM 2300, *Recreation, Wilderness, and Related Resource Management*,
Amendment No. 2300-91-3 Effective March 12, 1991. Chapter 2355, Off-Road
Vehicle Use Management, Executive Order 116-44, as amended by Executive
Order 11989, Use of Off-Road Vehicles on the Public Lands 37 FR 2877 (Feb. 9,
1972), 42 FR 26959 (May 25, 1977). (Referred to as FSM 2355)

FSM 2300, *Recreation, Wilderness, and Related Resource Management*, WO
AFSM 2300 - Recreation, Wilderness, and Related Resource Management, WO
Amendment 2300-90-1, Effective 6/1/90, Chapter 2310 - Planning and Data
Management - 2312 - Recreation Information Management (RIM). (Referred to
as (FSM 2312)

FSM 2400, *Timber Management*, WO Amendment 2400-96-6 Effective 9/24/96.
Chapter 2435 - Salvage Sales. 2435.05, Definitions. (FSM 2435)

FSM 2500, *Watershed and Air Management*, Amendment No. 2500-94-4,
Effective Dec. 20, 1994. Chapter 2520, Watershed Protection and Management.
2521 - Watershed Condition Assessment. 2521.05 - Definitions. (Referred to as
FSM 2521)

FSM 2500, *Watershed and Air Management*, Amendment No. 2500-94-4,
Effective Dec. 20, 1994. Chapter 2520, Watershed Protection and Management.
FSM 2526 - Riparian Area Management. 2526.05 - Definitions. (Referred to as
FSM 2526)

FSM 2600, *Wildlife, Fish, and Sensitive Plant Habitat Management*, Amendment
No. 2600-91-8 Effective Oct. 22, 1991, Chapter 2605, Definitions. (Referred to
as FSM 2605)

FSM 2600, *Wildlife, Fish, and Sensitive Plant Habitat Management*, WO
Amendment 2600-95-7, Effective 6/23/95, Chapter 2670, Threatened,
Endangered, and Sensitive Plants and Animals, 2670.5 - Definitions. (Referred to
as FSM 2670)

A User's Guide to Forest Information Retrieval (FIR), Southeastern Forest
Experiment Station, Forest Inventory and Analysis Unit, Asheville, NC, 1988.
(Referred to as FIR)

Interim Resource Inventory Glossary, File 1900, Washington, DC, 96 p., June 14,
1989. (Referred to IRIG)